

List

List is an ordered sequence of items We can have different data types under a list like we have integer,float and string items in a list

```
In [3]: #List creation
l1=[] #empty List
```

```
In [4]: print(type(l1))
```

```
<class 'list'>
```

```
In [5]: l2=[5,10,15,20] #list of integer numbers
l3=[4.5,6.8,4.8,7.9] #list of float numbers
print(l2)
print(l3)
```

```
[5, 10, 15, 20]
[4.5, 6.8, 4.8, 7.9]
```

```
In [6]: l4=['apple','banana','grapes','mango'] #List of string
l4
```

```
Out[6]: ['apple', 'banana', 'grapes', 'mango']
```

```
In [7]: l5=['Venky',10,[30,60],[100,200]] #nested list
l5
```

```
Out[7]: ['Venky', 10, [30, 60], [100, 200]]
```

```
In [8]: l6=[100,'Venky',20.45] #list of mixed data types
l6
```

```
Out[8]: [100, 'Venky', 20.45]
```

```
In [9]: l7=['Venky',98,75.5,[10,20],[20,40],{'Karthik','Venky'}]
l7
```

```
Out[9]: ['Venky', 98, 75.5, [10, 20], [20, 40], {'Karthik', 'Venky'}]
```

```
In [10]: len(l7)
```

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

List allows a string,integer,float It allows multiple data types in a single list

List Indexing

```
In [11]: l2
```

```
Out[11]: [5, 10, 15, 20]
```

```
In [12]: l2[0]
```

```
Out[12]: 5
```

```
In [13]: l3[2]
```

Out[13]: 4.8

In [14]: 12[3]

Out[14]: 20

In [15]: 14[1]

Out[15]: 'banana'

In [16]: 15[2]

Out[16]: [30, 60]

In [17]: 12[-1]

Out[17]: 20

In [18]: 14

Out[18]: ['apple', 'banana', 'grapes', 'mango']

In [19]: 15

Out[19]: ['Venky', 10, [30, 60], [100, 200]]

In [20]: 15[0][0]

Out[20]: 'v'

In [21]: 15[2][0]

Out[21]: 30

In [22]: 15[-1]

Out[22]: [100, 200]

In [23]: 16[-1]

Out[23]: 20.45

In [24]: 13

Out[24]: [4.5, 6.8, 4.8, 7.9]

In [25]: 13[0:2]

Out[25]: [4.5, 6.8]

In [26]: 14

Out[26]: ['apple', 'banana', 'grapes', 'mango']

In [27]: 15

Out[27]: ['Venky', 10, [30, 60], [100, 200]]

In [28]: 15[1:3]

Out[28]: [10, [30, 60]]

In [29]: 15[1:2]

Out[29]: [10]

In [30]: 15[1:4]

Out[30]: [10, [30, 60], [100, 200]]

In [31]: 15[:]

Out[31]: ['Venky', 10, [30, 60], [100, 200]]

In [32]: 15[1:]

Out[32]: [10, [30, 60], [100, 200]]

In [33]: 15[:3]

Out[33]: ['Venky', 10, [30, 60]]

In [34]: 15[-1]

Out[34]: [100, 200]

In [35]: 15[-1]

Out[35]: [100, 200]

In [36]: 15[-3:]

Out[36]: [10, [30, 60], [100, 200]]

In [37]: 15[-1:]

Out[37]: [[100, 200]]

In [38]: 15[:-3]

Out[38]: ['Venky']

In [39]: 15

Out[39]: ['Venky', 10, [30, 60], [100, 200]]

Add,remove and change Items

In [40]: 11

Out[40]: []

In [41]: 12

Out[41]: [5, 10, 15, 20]

In [42]: 18=['zero','one','two','three','four','five','six','seven','eight','nine']
18

Out[42]: ['zero',
 'one',
 'two',
 'three',
 'four',
 'five',
 'six',
 'seven',
 'eight',
 'nine']

In [43]: 18.append(10) *#append() function will append the value at the end of the list*

In [44]: 18

Out[44]: ['zero',
 'one',
 'two',
 'three',
 'four',
 'five',
 'six',
 'seven',
 'eight',
 'nine',
 10]

In [45]: 18.insert(8,'Venky')
18

Out[45]: ['zero',
 'one',
 'two',
 'three',
 'four',
 'five',
 'six',
 'seven',
 'Venky',
 'eight',
 'nine',
 10]

In [46]: 18.insert(2,100)
18

```
Out[46]: ['zero',  
          'one',  
          100,  
          'two',  
          'three',  
          'four',  
          'five',  
          'six',  
          'seven',  
          'Venky',  
          'eight',  
          'nine',  
          10]
```

```
In [47]: 18.insert(5, '@venky') #insert() requires 2 parameters one is index another is value  
18
```

```
Out[47]: ['zero',  
          'one',  
          100,  
          'two',  
          'three',  
          '@venky',  
          'four',  
          'five',  
          'six',  
          'seven',  
          'Venky',  
          'eight',  
          'nine',  
          10]
```

```
In [48]: 18.remove('zero') #remove() will remove the selected value from the list  
18
```

```
Out[48]: ['one',  
          100,  
          'two',  
          'three',  
          '@venky',  
          'four',  
          'five',  
          'six',  
          'seven',  
          'Venky',  
          'eight',  
          'nine',  
          10]
```

```
In [49]: 18.pop() #pop() will remove the last element of the list
```

```
Out[49]: 10
```

```
In [50]: 18
```

```
Out[50]: ['one',
          100,
          'two',
          'three',
          '@venky',
          'four',
          'five',
          'six',
          'seven',
          'Venky',
          'eight',
          'nine']
```

```
In [51]: 18.pop(13)
```

```
-----
IndexError                                Traceback (most recent call last)
Cell In[51], line 1
----> 1 18.pop(13)

IndexError: pop index out of range
```

```
In [52]: 18
```

```
Out[52]: ['one',
          100,
          'two',
          'three',
          '@venky',
          'four',
          'five',
          'six',
          'seven',
          'Venky',
          'eight',
          'nine']
```

```
In [53]: del 18[5] #when we use delete function(del) we have to pass parameter within square brace
18
```

```
Out[53]: ['one',
          100,
          'two',
          'three',
          '@venky',
          'five',
          'six',
          'seven',
          'Venky',
          'eight',
          'nine']
```

```
In [54]: del 18(5) #if we call a function within normal braces it will show error:cannot delete fun
18
```

```
Cell In[54], line 1
    del l8(5) #if we call a function within normal braces it will show error:cannot delete
function call
    ^
SyntaxError: cannot delete function call
```

```
In [55]: #Change the value of the List
18[0]=1
18[1]=2
18[2]=3
18
```

```
Out[55]: [1, 2, 3, 'three', '@venky', 'five', 'six', 'seven', 'Venky', 'eight', 'nine']
```

```
In [56]: 18.clear() #clear() function will delete all items in the list
```

```
In [57]: 18
```

```
Out[57]: []
```

```
In [58]: del 18
18
```

```
-----
NameError                                Traceback (most recent call last)
Cell In[58], line 2
      1 del 18
----> 2 18
NameError: name '18' is not defined
```

Copy List

```
In [59]: 19=['one','two','three','four','five','six','seven']
19
```

```
Out[59]: ['one', 'two', 'three', 'four', 'five', 'six', 'seven']
```

```
In [60]: 110=19
```

```
In [61]: 110
```

```
Out[61]: ['one', 'two', 'three', 'four', 'five', 'six', 'seven']
```

```
In [62]: id(19),id(110)
```

```
Out[62]: (2420977110656, 2420977110656)
```

```
In [63]: 111=19.copy() #Create copy of the List
111
```

```
Out[63]: ['one', 'two', 'three', 'four', 'five', 'six', 'seven']
```

```
In [64]: id(111)
```

```
Out[64]: 2420977026176
```

```
In [65]: id(l10)
```

```
Out[65]: 2420977110656
```

```
In [66]: l9[0]=1
```

```
In [67]: l9
```

```
Out[67]: [1, 'two', 'three', 'four', 'five', 'six', 'seven']
```

```
In [68]: l10
```

```
Out[68]: [1, 'two', 'three', 'four', 'five', 'six', 'seven']
```

```
In [69]: l11
```

```
Out[69]: ['one', 'two', 'three', 'four', 'five', 'six', 'seven']
```

Join Lists

```
In [70]: list1=['one','two','three']  
list2=['four','five','six']  
list3=list1+list2  
list3
```

```
Out[70]: ['one', 'two', 'three', 'four', 'five', 'six']
```

```
In [71]: list1.extend(list2)  
list1
```

```
Out[71]: ['one', 'two', 'three', 'four', 'five', 'six']
```

```
In [72]: list1.extend(list2)  
list1
```

```
Out[72]: ['one', 'two', 'three', 'four', 'five', 'six', 'four', 'five', 'six']
```

```
In [73]: list2.extend(list1)  
list2
```

```
Out[73]: ['four',  
          'five',  
          'six',  
          'one',  
          'two',  
          'three',  
          'four',  
          'five',  
          'six',  
          'four',  
          'five',  
          'six']
```

List Membership

```
In [74]: list1
```


Out[74]: ['one', 'two', 'three', 'four', 'five', 'six', 'four', 'five', 'six']

```
In [75]: lm=['one','two','three','four']  
lm
```

Out[75]: ['one', 'two', 'three', 'four']

```
In [76]: 'one' in lm
```

Out[76]: True

```
In [77]: 'one' not in lm
```

Out[77]: False

```
In [78]: 'five' in lm
```

Out[78]: False

```
In [79]: if 'three' in lm:  
    print("Three is present in list")  
else:  
    print("Three is not present in list")
```

Three is present in list

```
In [80]: if "five" in lm:  
    print("Five is present in the list")  
else:  
    print("Five is not present in the list")
```

Five is not present in the list

Reverse and Sort List

```
In [81]: lm
```

Out[81]: ['one', 'two', 'three', 'four']

```
In [82]: lm.reverse()  
lm
```

Out[82]: ['four', 'three', 'two', 'one']

```
In [83]: lm[::-1]
```

Out[83]: ['one', 'two', 'three', 'four']

```
In [84]: lm.reverse()  
lm
```

Out[84]: ['one', 'two', 'three', 'four']

```
In [85]: 16
```

Out[85]: [100, 'Venky', 20.45]

```
In [86]: 16.reverse()  
16
```

```
Out[86]: [20.45, 'Venky', 100]
```

```
In [87]: 16[::-1]
```

```
Out[87]: [100, 'Venky', 20.45]
```

```
In [88]: 1m
```

```
Out[88]: ['one', 'two', 'three', 'four']
```

```
In [89]: 1m.sort()  
1m
```

```
Out[89]: ['four', 'one', 'three', 'two']
```

```
In [90]: 1r=[9,7,6,15,42,66,23,15,2,49,3]  
1r
```

```
Out[90]: [9, 7, 6, 15, 42, 66, 23, 15, 2, 49, 3]
```

```
In [91]: 1r.reverse()  
1r
```

```
Out[91]: [3, 49, 2, 15, 23, 66, 42, 15, 6, 7, 9]
```

```
In [92]: 1r.sort()  
1r
```

```
Out[92]: [2, 3, 6, 7, 9, 15, 15, 23, 42, 49, 66]
```

```
In [93]: 1r.reverse()  
1r
```

```
Out[93]: [66, 49, 42, 23, 15, 15, 9, 7, 6, 3, 2]
```

```
In [94]: 1r.sort(reverse=True)  
1r
```

```
Out[94]: [66, 49, 42, 23, 15, 15, 9, 7, 6, 3, 2]
```

```
In [95]: 1r1=[9,7,6,15,42,66,23,15,2,49,3]  
1r1.sort(reverse=True)  
1r1
```

```
Out[95]: [66, 49, 42, 23, 15, 15, 9, 7, 6, 3, 2]
```

```
In [96]: 1r2=[76,42,45,50,37,90]  
sorted(1r2) #returns new sorted list and doesn't change original list
```

```
Out[96]: [37, 42, 45, 50, 76, 90]
```

```
In [97]: 1r2
```

Out[97]: [76, 42, 45, 50, 37, 90]

Loop through a list

```
In [98]: lt=[2,4,6,7,9,14,23]
lt
```

Out[98]: [2, 4, 6, 7, 9, 14, 23]

```
In [99]: for i in lt:
          print(i)
```

2
4
6
7
9
14
23

```
In [100]: for i in enumerate(lt):
          print(i)
```

(0, 2)
(1, 4)
(2, 6)
(3, 7)
(4, 9)
(5, 14)
(6, 23)

Count

```
In [101]: lc=[1,2,5,4,8,1,2,5,7,9,9,7]
lc.count(1)
```

Out[101]: 2

```
In [102]: lc.count(9)
```

Out[102]: 2

```
In [103]: lc.count(2)
```

Out[103]: 2

```
In [104]: lc1=['a','b','c','d','a','b','c','d','a','b','e']
lc1.count('a')
```

Out[104]: 3

All/Any The all() method returns: True-If all statements in a list are true False-If any element in a list is false Tha any() function returns True if any element in the list is True. If not, any() returns False

```
In [105]: L1=[1,2,3,4,5,0,6]
all(L1)
```

Out[105... False

In [106... any(L1)

Out[106... True

In [107... L2=[1,2,3,4,True,False]
all(L2)

Out[107... False

In [108... any(L2)

Out[108... True

In [109... L3=[1,2,3,4,True]
any(L3)

Out[109... True

In [110... all(L3)

Out[110... True

In [111... L4=[]
any(L4)

Out[111... False

In []: