List Creation

```
In [6]:   list1=[]
          list1
```

Out[6]:   []

```
In [7]:   print(type(list1))
```

<class 'list'>

```
In [18]:  list2=[10,30,60]
          list2
```

Out[18]: [10, 30, 60]

```
In [10]:  list3=[10.77,30.66,60.89]
          list3
```

Out[10]: [10.77, 30.66, 60.89]

```
In [11]:  list4=['one','two','three']
          list4
```

Out[11]: ['one', 'two', 'three']

```
In [12]:  list5=['Asif',25,[50,100],(150,99),22.88,{1,2,3}]
          list5
```

Out[12]: ['Asif', 25, [50, 100], (150, 99), 22.88, {1, 2, 3}]

```
In [13]:  list6=['neha',1,[11,12],{'rohit,nikita'}]
          list6
```

Out[13]: ['neha', 1, [11, 12], {'rohit,nikita'}]

```
In [14]:  len(list6)
```

Out[14]: 4

List Indexing

```
In [19]:  list2
```

Out[19]: [10, 30, 60]

```
In [20]:  list2[0]
```

Out[20]: 10

```
In [21]: list2[0:]
```

Out[21]: [10, 30, 60]

```
In [22]: list2.append(90)
         list2.append(120)
         list2.append(150)
         list2
```

Out[22]: [10, 30, 60, 90, 120, 150]

```
In [23]: list2[:]
```

Out[23]: [10, 30, 60, 90, 120, 150]

```
In [24]: len(list2)
```

Out[24]: 6

```
In [25]: list2[:4]
```

Out[25]: [10, 30, 60, 90]

```
In [27]: list[:-1]
```

Out[27]: list[slice(None, -1, None)]

```
In [28]: list4[0]
```

Out[28]: 'one'

```
In [29]: list5[2][1]
```

Out[29]: 100

```
In [30]: list4[-1]
```

Out[30]: 'three'

```
In [31]: list5[-1]
```

Out[31]: {1, 2, 3}

```
In [32]: list2[::-1]
```

Out[32]: [150, 120, 90, 60, 30, 10]

List Slicing

```
In [2]: mylist=['one','two','three','four','five','six','seven','eight']
```

```
mylist
```

Out[2]:   `['one', 'two', 'three', 'four', 'five', 'six', 'seven', 'eight']`

In [34]:
```
mylist[0:3]
```

Out[34]:   `['one', 'two', 'three']`

In [35]:
```
mylist[2:5]
```

Out[35]:   `['three', 'four', 'five']`

In [36]:
```
mylist[:3]
```

Out[36]:   `['one', 'two', 'three']`

In [37]:
```
mylist[:2]
```

Out[37]:   `['one', 'two']`

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

Out[38]:   `['six', 'seven', 'eight']`

In [39]:
```
mylist[-2:]
```

Out[39]:   `['seven', 'eight']`

In [40]:
```
mylist[-1]
```

Out[40]:   `'eight'`

In [41]:
```
mylist[:]
```

Out[41]:   `['one', 'two', 'three', 'four', 'five', 'six', 'seven', 'eight']`

Add, Remove and Change Items

In [6]:
```
mylist
```

Out[6]:   `['ONE', 'one', 'two', 'three', 'four', 'five', 'six', 'seven', 'eight']`

In [7]:
```
mylist.append('nine')
mylist
```

Out[7]:   `['ONE', 'one', 'two', 'three', 'four', 'five', 'six', 'seven', 'eight', 'nine']`

In [8]:
```
mylist.insert(9,'ten')
mylist
```

```
Out[8]:  ['ONE',
          'one',
          'two',
          'three',
          'four',
          'five',
          'six',
          'seven',
          'eight',
          'ten',
          'nine']
```

```
In [9]:  mylist.insert(0,'ONE')
         mylist
```

```
Out[9]:  ['ONE',
          'ONE',
          'one',
          'two',
          'three',
          'four',
          'five',
          'six',
          'seven',
          'eight',
          'ten',
          'nine']
```

```
In [10]:  mylist.remove('ONE') # Remove item "ONE"
          mylist
```

```
Out[10]:  ['ONE',
           'one',
           'two',
           'three',
           'four',
           'five',
           'six',
           'seven',
           'eight',
           'ten',
           'nine']
```

```
In [12]:  mylist.pop() # Remove last item of the list
          mylist
```

```
Out[12]:  ['ONE', 'one', 'two', 'three', 'four', 'five', 'six', 'seven', 'eight']
```

```
In [51]:  mylist.pop(4)
          mylist
```

```
Out[51]:  ['one', 'two', 'three', 'four', 'six', 'seven', 'eight', 'nine']
```

```
In [52]:  mylist.insert(4,'five')
          mylist
```

Out[52]: ['one', 'two', 'three', 'four', 'five', 'six', 'seven', 'eight', 'nine']

In [55]:
```python
del mylist[6]
mylist
```

Out[55]: ['one', 'two', 'three', 'four', 'five', 'six']

In [56]:
```python
len(mylist)
```

Out[56]: 6

In [13]:
```python
# Change value of the string
mylist[0]=1
mylist[1]=2
mylist[2]=3
mylist
```

Out[13]: [1, 2, 3, 'three', 'four', 'five', 'six', 'seven', 'eight']

In [14]:
```python
mylist.clear() # Empty List / Delete all items in the list
mylist
```

Out[14]: []

In [59]:
```python
len(mylist)
```

Out[59]: 0

In [60]:
```python
mylist=['one','two','three','four','five','six','seven','eight']
mylist
```

Out[60]: ['one', 'two', 'three', 'four', 'five', 'six', 'seven', 'eight']

In [15]:
```python
del mylist
mylist
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[15], line 2
      1 del mylist
----> 2 mylist

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

Copy List

In [16]:
```python
mylist=['one','two','three','four','five','six','seven','eight']
mylist
```

Out[16]: ['one', 'two', 'three', 'four', 'five', 'six', 'seven', 'eight']

```
In [17]: mylist1=mylist # Create a new reference "mylist1"
         mylist1
```

Out[17]: ['one', 'two', 'three', 'four', 'five', 'six', 'seven', 'eight']

```
In [18]: id(mylist),id(mylist1) # The address of both mylist & mylist1 will be the same
```

Out[18]: (2045974282304, 2045974282304)

```
In [19]: mylist2=mylist1.copy() # Create a copy of the list
         mylist2
```

Out[19]: ['one', 'two', 'three', 'four', 'five', 'six', 'seven', 'eight']

```
In [21]: id(mylist2) # The address of mylist2 will be different from mylist because mylis
```

Out[21]: 2046003502592

```
In [22]: mylist[0]=1
         mylist
```

Out[22]: [1, 'two', 'three', 'four', 'five', 'six', 'seven', 'eight']

```
In [24]: mylist1 # mylist1 will be also impacted as it is pointing to the same list
```

Out[24]: [1, 'two', 'three', 'four', 'five', 'six', 'seven', 'eight']

```
In [25]: mylist2 # Copy of list won't be impacted due to changes made on the original list
```

Out[25]: ['one', 'two', 'three', 'four', 'five', 'six', 'seven', 'eight']

Join Lists

```
In [26]: list1=['one','two','three','four']
         list2=['five','six','seven','eight']
         print(list1)
         print(list2)
```

```
['one', 'two', 'three', 'four']
['five', 'six', 'seven', 'eight']
```

```
In [27]: list3=list1+list2
         list3
```

Out[27]: ['one', 'two', 'three', 'four', 'five', 'six', 'seven', 'eight']

```
In [28]: list1.extend(list2) #Append list2 with list1
         list1
```

Out[28]: ['one', 'two', 'three', 'four', 'five', 'six', 'seven', 'eight']

```
In [20]: print(list1)
         print(list3)
```

```
['one', 'two', 'three', 'four', 'five', 'six', 'seven', 'eight']
['one', 'two', 'three', 'four', 'five', 'six', 'seven', 'eight']
```

```
In [21]: list1
```

```
Out[21]: ['one', 'two', 'three', 'four', 'five', 'six', 'seven', 'eight']
```

List Membership

```
In [29]: list1
```

```
Out[29]: ['one', 'two', 'three', 'four', 'five', 'six', 'seven', 'eight']
```

```
In [30]: 'one' in list1 # Check if 'one' exist in the list
```

```
Out[30]: True
```

```
In [33]: list1[2]='Three'
         list1
```

```
Out[33]: ['one', 'two', 'Three', 'four', 'five', 'six', 'seven', 'eight']
```

```
In [31]: 'eleven' in list1 # Check if 'eleven' exist in the list
```

```
Out[31]: False
```

```
In [34]: 'ten' in list1
```

```
Out[34]: False
```

```
In [35]: list1
```

```
Out[35]: ['one', 'two', 'Three', 'four', 'five', 'six', 'seven', 'eight']
```

```
In [36]: if 'Three' in list1: # Check if 'three' exist in the list
             print('Three is present in the list.')
         else:
             print('Three is not present in the list.')
```

```
Three is present in the list.
```

```
In [37]: if 'Eleven' in list1: # Check if 'eleven' exist in the list
             print('Eleven is present in the list.')
         else:
             print('Eleven is not present in the list.')
```

```
Eleven is not present in the list.
```

Reverse and Sort List

```
In [39]: list1
```

```
Out[39]: ['one', 'two', 'Three', 'four', 'five', 'six', 'seven', 'eight']
```

```
In [40]: list1.reverse() # Reverse the list
         list1
```

```
Out[40]: ['eight', 'seven', 'six', 'five', 'four', 'Three', 'two', 'one']
```

```
In [42]: list1[::-1] # Reverse the list
```

```
Out[42]: ['one', 'two', 'Three', 'four', 'five', 'six', 'seven', 'eight']
```

```
In [43]: mylist3=[9,5,2,99,12,88,34]
         mylist3
```

```
Out[43]: [9, 5, 2, 99, 12, 88, 34]
```

```
In [44]: mylist3.sort() # Sort list in ascending order
         mylist3
```

```
Out[44]: [2, 5, 9, 12, 34, 88, 99]
```

```
In [45]: mylist3.sort(reverse=True) # Sort list in descending order
         mylist3
```

```
Out[45]: [99, 88, 34, 12, 9, 5, 2]
```

```
In [46]: mylist4=[88,65,33,21,11,98]
         mylist4
```

```
Out[46]: [88, 65, 33, 21, 11, 98]
```

```
In [48]: sorted(mylist4) # Returns a new sorted list and doesn't change original list
```

```
Out[48]: [11, 21, 33, 65, 88, 98]
```

```
In [39]: list1[::-1]
```

```
Out[39]: ['one', 'two', 'Three', 'four', 'five', 'six', 'seven', 'eight']
```

Loop Through List

```
In [49]: list1=['one','two','three','four','five','six','seven','eight']
         list1
```

```
Out[49]: ['one', 'two', 'three', 'four', 'five', 'six', 'seven', 'eight']
```

```
In [46]: for i in list1:
             print(i)
```

```
one
two
three
four
five
six
seven
eight
```

In [48]:
```python
for i in enumerate (list1):
    print(i)
```

```
(0, 'one')
(1, 'two')
(2, 'three')
(3, 'four')
(4, 'five')
(5, 'six')
(6, 'seven')
(7, 'eight')
```

Count

In [49]:
```python
list10=['one','two','one','three','four','one','two']
list10
```

Out[49]:
```
['one', 'two', 'one', 'three', 'four', 'one', 'two']
```

In [51]:
```python
list10.count('one')
```

Out[51]: 3

In [52]:
```python
list10.count('two')
```

Out[52]: 2

In [53]:
```python
list10.count('four')
```

Out[53]: 1

All/Any

In [11]:
```python
l1=[1,2,3,4,0]
l1
```

Out[11]: [1, 2, 3, 4, 0]

In [55]:
```python
all(l1)
```

Out[55]: False

```python
In [56]: any(l1)
```

Out[56]: True

```python
In [58]: l2=[1,3,5,8,True,False]
         l2
```

Out[58]: [1, 3, 5, 8, True, False]

```python
In [59]: all(l2)
```

Out[59]: False

```python
In [60]: any(l2)
```

Out[60]: True

```python
In [61]: l3=[1,2,3,4,5]
         l3
```

Out[61]: [1, 2, 3, 4, 5]

```python
In [62]: all(l3)
```

Out[62]: True

```python
In [63]: any(l3)
```

Out[63]: True

```python
In [64]: mystring='WELCOME'
         mylist1=[i for i in mystring]x`
         mylist1
```

Out[64]: ['W', 'E', 'L', 'C', 'O', 'M', 'E']

```python
In [66]: mystring1='RAILWAYSTATION'
         mylist2=[i for i in mystring1]
         mylist2
```

Out[66]: ['R', 'A', 'I', 'L', 'W', 'A', 'Y', 'S', 'T', 'A', 'T', 'I', 'O', 'N']

```python
In [67]: len(mystring1)
```

Out[67]: 14

```python
In [68]: mylist3=[i for i in range(40) if i % 2 == 0]
         mylist3
```

Out[68]: [0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38]

```
In [69]: mylist4=[i for i in range(50) if i % 2 == 0]
         mylist4
```

```
Out[69]: [0,
          2,
          4,
          6,
          8,
          10,
          12,
          14,
          16,
          18,
          20,
          22,
          24,
          26,
          28,
          30,
          32,
          34,
          36,
          38,
          40,
          42,
          44,
          46,
          48]
```

```
In [70]: mylist5=[i for i in range(20) if i % 2 == 0]
         mylist5
```

```
Out[70]: [0, 2, 4, 6, 8, 10, 12, 14, 16, 18]
```

```
In [71]: mylist6 = [i for i in range(50) if i % 2 == 1]
         mylist6
```

```
Out[71]: [1,
          3,
          5,
          7,
          9,
          11,
          13,
          15,
          17,
          19,
          21,
          23,
          25,
          27,
          29,
          31,
          33,
          35,
          37,
          39,
          41,
          43,
          45,
          47,
          49]
```

```
In [72]: mylist7=[num**2 for num in range (10)]
         mylist7
```

```
Out[72]: [0, 1, 4, 9, 16, 25, 36, 49, 64, 81]
```

```
In [74]: mylist8=[num**2 for num in range(20)]
         mylist8
```

```
Out[74]: [0,
          1,
          4,
          9,
          16,
          25,
          36,
          49,
          64,
          81,
          100,
          121,
          144,
          169,
          196,
          225,
          256,
          289,
          324,
          361]
```

```
In [5]:  list1=[1,2,3,4,5,6,7,8]
         list1
```

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

```
In [6]:  list1=[i*10 for i in list1]
         list1
```

```
Out[6]:  [10, 20, 30, 40, 50, 60, 70, 80]
```

```
In [8]:  list1=[1,2,3,4,5,6,7,8]
         list2=[i*3 for i in list1]
         list2
```

```
Out[8]:  [3, 6, 9, 12, 15, 18, 21, 24]
```

```
In [9]:  mylist4=[i for i in range(200) if i% 3 == 0 if i%9 == 0 if i % 12 == 0]
         mylist4
```

```
Out[9]:  [0, 36, 72, 108, 144, 180]
```

```
In [10]:  len(mylist4)
```

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

```
In [18]:  l1
```

```
Out[18]:  [1, 2, 3, 4, 0]
```

```
In [21]:  l1= [print("{} is Even number") if i%2 == 0 else print("{} is a odd number")]
          l1
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[21], line 1
----> 1 l1= [print("{} is Even number") if i%2 == 0 else print("{} is a odd numbe
r")]
      2 l1

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

```
In [19]:  l1=[i for i in l1 if i%2 == 0]
          l1
```

```
Out[19]:  [2, 4, 0]
```