

LIST

```
In [365... #Creation of list
```

```
In [366... list = []
```

```
In [367... print(type(list))
```

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

```
In [368... list1 = [10, 20, 30, 40, 50, 60, 70]
```

```
In [369... len(list1)
```

```
Out[369... 7
```

```
In [370... #Indexing
```

```
In [371... list1[3]
```

```
Out[371... 40
```

```
In [372... list1[2]
```

```
Out[372... 30
```

```
In [373... list1[-1]
```

```
Out[373... 70
```

```
In [374... #Slicing
```

```
In [375... mylist = ['one', 'two', 'three', 'four', 'five', 'six', 'seven', 'eight', 'nine']
```

```
In [376... mylist[0:6]
```

```
Out[376... ['one', 'two', 'three', 'four', 'five', 'six']
```

```
In [377... mylist[:5]
```

```
Out[377... ['one', 'two', 'three', 'four', 'five']
```

```
In [378... mylist[7:]
```

```
Out[378... ['eight', 'nine']
```

```
In [379... mylist[:-1]
```

```
Out[379... ['one', 'two', 'three', 'four', 'five', 'six', 'seven', 'eight']
```

```
In [380... mylist[-1:]
```

Out[380... ['nine']

In [381... `mylist[:]`

Out[381... ['one', 'two', 'three', 'four', 'five', 'six', 'seven', 'eight', 'nine']

In [382... *#Append*

In [383... `mylist.append('ten')`

In [384... `mylist`

Out[384... ['one', 'two', 'three', 'four', 'five', 'six', 'seven', 'eight', 'nine', 'ten']

In [385... `mylist.append('one')`

In [386... `mylist`

Out[386... ['one',
'two',
'three',
'four',
'five',
'six',
'seven',
'eight',
'nine',
'ten',
'one']

In [387... *#Count*

In [388... `mylist.count('one')`

Out[388... 2

In [389... `mylist`

Out[389... ['one',
'two',
'three',
'four',
'five',
'six',
'seven',
'eight',
'nine',
'ten',
'one']

In [390... *#Copy*

In [391... `mylist1 = mylist.copy()`

In [392... `mylist1`

```
Out[392... ['one',  
            'two',  
            'three',  
            'four',  
            'five',  
            'six',  
            'seven',  
            'eight',  
            'nine',  
            'ten',  
            'one']
```

```
In [393... mylist
```

```
Out[393... ['one',  
            'two',  
            'three',  
            'four',  
            'five',  
            'six',  
            'seven',  
            'eight',  
            'nine',  
            'ten',  
            'one']
```

```
In [394... #Append
```

```
In [395... mylist1
```

```
Out[395... ['one',  
            'two',  
            'three',  
            'four',  
            'five',  
            'six',  
            'seven',  
            'eight',  
            'nine',  
            'ten',  
            'one']
```

```
In [396... mylist1.append('one')
```

```
In [397... mylist1
```

```
Out[397... ['one',  
            'two',  
            'three',  
            'four',  
            'five',  
            'six',  
            'seven',  
            'eight',  
            'nine',  
            'ten',  
            'one',  
            'one']
```

In [398... *#Pop*

In [399... `mylist1.pop()`

Out[399... 'one'

In [400... *#Remove*

In [401... `mylist1.remove('one')`

In [402... `mylist1`

Out[402... ['two', 'three', 'four', 'five', 'six', 'seven', 'eight', 'nine', 'ten', 'one']

In [403... `mylist`

Out[403... ['one',
'two',
'three',
'four',
'five',
'six',
'seven',
'eight',
'nine',
'ten',
'one']

In [404... *#Clear*

In [405... `mylist.clear()`

In [406... `mylist`

Out[406... []

In [407... *#Indexing*

In [408... `mylist1`

Out[408... ['two', 'three', 'four', 'five', 'six', 'seven', 'eight', 'nine', 'ten', 'one']

In [409... `mylist1.index('nine')`

Out[409... 7

In [410... *#Extend*

In [411... `mylist = [2,3,4,5,6,7,8,9]`

In [412... `mylist`

Out[412... [2, 3, 4, 5, 6, 7, 8, 9]

In [413... `mylist.extend(mylist1)`

In [414... mylist

Out[414... [2,
3,
4,
5,
6,
7,
8,
9,
'two',
'three',
'four',
'five',
'six',
'seven',
'eight',
'nine',
'ten',
'one']

In [415... *#Insert in list*

In [416... mylist1.insert(0, 'one')

In [417... mylist1

Out[417... ['one',
'two',
'three',
'four',
'five',
'six',
'seven',
'eight',
'nine',
'ten',
'one']

In [418... mylist1.insert(10, '11')

In [419... mylist1

Out[419... ['one',
'two',
'three',
'four',
'five',
'six',
'seven',
'eight',
'nine',
'ten',
'11',
'one']

In [420... mylist2 = [100, 200, 3, 80, 94, 12, 56, 45, 33, 70]
mylist2

Out[420... [100, 200, 3, 80, 94, 12, 56, 45, 33, 70]

In [421... *#List membership*

In [422... list = ['one', 'two', 'three', 'four', 'five', 'six', 'seven', 'eight', 'nine']

In [423... 'nine' in list

Out[423... True

In [424... 'ten' in list

Out[424... False

```
In [425... if 'seven' in list:
    print('Seven is present in the list')
else:
    print('Seven is not present in the list')
```

Seven is present in the list

```
In [426... if 'Ten' in list:
    print('Ten is present in the list')
else:
    print('Ten is not present in the list')
```

Ten is not present in the list

In [427... *# Reverse & Sort in List*

In [428... mylist2.reverse()

In [429... mylist2

Out[429... [70, 33, 45, 56, 12, 94, 80, 3, 200, 100]

```
In [430... mylist2.sort()
mylist2
```

Out[430... [3, 12, 33, 45, 56, 70, 80, 94, 100, 200]

```
In [431... mylist2.sort(reverse = True)
mylist2
```

Out[431... [200, 100, 94, 80, 70, 56, 45, 33, 12, 3]

```
In [432... mylist2.sort(reverse = False)
mylist2
```

Out[432... [3, 12, 33, 45, 56, 70, 80, 94, 100, 200]

```
In [433... mylist1.sort()
mylist1
```

```
Out[433... ['11',  
            'eight',  
            'five',  
            'four',  
            'nine',  
            'one',  
            'one',  
            'seven',  
            'six',  
            'ten',  
            'three',  
            'two']
```

```
In [434... mylist1.sort(reverse = True)  
mylist1
```

```
Out[434... ['two',  
            'three',  
            'ten',  
            'six',  
            'seven',  
            'one',  
            'one',  
            'nine',  
            'four',  
            'five',  
            'eight',  
            '11']
```

```
In [435... # Loop through a list
```

```
In [436... for i in mylist1:  
            print(i)
```

```
two  
three  
ten  
six  
seven  
one  
one  
nine  
four  
five  
eight  
11
```

```
In [437... for i in enumerate(mylist1):  
            print(i)
```

```
(0, 'two')
(1, 'three')
(2, 'ten')
(3, 'six')
(4, 'seven')
(5, 'one')
(6, 'one')
(7, 'nine')
(8, 'four')
(9, 'five')
(10, 'eight')
(11, '11')
```

In [438... *# ALL / Any*

In [439... `L1 = [9,8,7,6,5,4]`
`all(L1)`

Out[439... True

In [440... `any(L1)`

Out[440... True

In [441... `L2 = [1, 2, 3, 4, True]`
`all(L2)`

Out[441... True

In [442... `L2 = [1, 2, 3, 4, False]`
`all(L2)`

Out[442... False

In [443... `L3 = [1, 2, 3, 4, True]`
`any(L3)`

Out[443... True

In [444... `L4 = [False]`
`any(L4)`

Out[444... False

In [445... `L5 = [1, 2, 3, 4, False]`
`any(L5)`

Out[445... True

TUPLE

In [446... *#Tuple creation*

In [447... `tup1 = ()`
`tup1`

Out[447...]

```
In [448... tup2 = (10, 20.00, 'three', (1,8),(5,4))
tup2
```

Out[448... (10, 20.0, 'three', (1, 8), (5, 4))

```
In [449... len(tup2)
```

Out[449... 5

```
In [450... #Tuple indexing
```

```
In [451... tup2[3]
```

Out[451... (1, 8)

```
In [452... tup2[1]
```

Out[452... 20.0

```
In [453... tup2[2]
```

Out[453... 'three'

```
In [454... #Tuple slicing
```

```
In [455... tup2[0:3]
```

Out[455... (10, 20.0, 'three')

```
In [456... tup2[:3]
```

Out[456... (10, 20.0, 'three')

```
In [457... tup2[-3:]
```

Out[457... ('three', (1, 8), (5, 4))

```
In [458... tup2[:]
```

Out[458... (10, 20.0, 'three', (1, 8), (5, 4))

```
In [459... # Remove, Delete and Change items in tuple
```

```
In [460... tup = ('one', 'two', 'three', 'four', 'five', 'six', 'seven', 'eight', 'nine', '
tup
```

Out[460... ('one', 'two', 'three', 'four', 'five', 'six', 'seven', 'eight', 'nine', 'ten')

```
In [461... del tup[0]
```

```
-----  
TypeError                                Traceback (most recent call last)  
Cell In[461], line 1  
----> 1 del tup[0]  
  
TypeError: 'tuple' object doesn't support item deletion
```

```
In [ ]: tup[0] = 1
```

```
In [462... del tup
```

```
In [463... #Loop through a tuple
```

```
In [464... for i in tup:  
            print(i)
```

```
-----  
NameError                                Traceback (most recent call last)  
Cell In[464], line 1  
----> 1 for i in tup:  
      2     print(i)  
  
NameError: name 'tup' is not defined
```

```
In [472... for i in enumerate(tup):  
            print(i)
```

```
-----  
NameError                                Traceback (most recent call last)  
Cell In[472], line 1  
----> 1 for i in enumerate(tup):  
      2     print(i)  
  
NameError: name 'tup' is not defined
```

```
In [473... #Count
```

```
In [474... mytup = ('one', 'two', 'three', 'four', 'one', 'one', 'two', 'three')
```

```
In [475... mytup.count('one')
```

```
Out[475... 3
```

```
In [476... mytup.count('two')
```

```
Out[476... 2
```

```
In [477... mytup.count('four')
```

```
Out[477... 1
```

```
In [478... #Tuple membership
```

```
In [479... mytup = ('one', 'two', 'three', 'four', 'five', 'six', 'seven')
```

```
In [480... 'one' in mytup
```

Out[480... True

```
In [481... 'nine' in mytup
```

Out[481... False

```
In [482... if 'seven' in mytup:
    print('Seven is present in the tuple')
else:
    print('Seven is not present in the tuple')
```

Seven is present in the tuple

```
In [483... if 'Nine' in mytup:
    print('Nine is present in the tuple')
else:
    print('Nine is not present in the tuple')
```

Nine is not present in the tuple

```
In [484... #Index position
```

```
In [485... tup = ('one', 'two', 'three', 'four', 'five', 'six', 'seven', 'eight', 'nine', '
tup
```

Out[485... ('one', 'two', 'three', 'four', 'five', 'six', 'seven', 'eight', 'nine', 'ten')

```
In [486... tup.index('seven')
```

Out[486... 6

```
In [487... tup[6]
```

Out[487... 'seven'

```
In [488... #Sorting
```

```
In [489... tup = (9, 72, 81, 18, 27, 54, 63, 36, 45, 90)
tup
```

Out[489... (9, 72, 81, 18, 27, 54, 63, 36, 45, 90)

```
In [490... sorted(tup)
```

Out[490... [9, 18, 27, 36, 45, 54, 63, 72, 81, 90]

```
In [491... sorted(tup, reverse = True)
```

Out[491... [90, 81, 72, 63, 54, 45, 36, 27, 18, 9]

SET

```
In [492... #Set Creation
```

```
In [493... myset = {1,2,3,4,5}
myset
```

```
Out[493... {1, 2, 3, 4, 5}
```

```
In [494... len(myset)
```

```
Out[494... 5
```

```
In [495... myset1 = {'Asif' , 'John' , 'Tyrion'}
myset1
```

```
Out[495... {'Asif', 'John', 'Tyrion'}
```

```
In [496... #Loop through a Set
```

```
In [497... myset = {'one', 'two', 'three', 'four', 'five', 'six', 'seven', 'eight'}
for i in myset:
    print(i)
```

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

```
In [498... for i in enumerate(myset):
    print(i)
```

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

```
In [499... #Set Membership
```

```
In [500... myset
```

```
Out[500... {'eight', 'five', 'four', 'one', 'seven', 'six', 'three', 'two'}
```

```
In [501... 'one' in myset
```

```
Out[501... True
```

```
In [502... 'ten' in myset
```

```
Out[502... False
```

```
In [503... if 'seven' in myset:
    print('Seven is present in the set')
```

```
else:  
    print('Seven is not present in the set')
```

Seven is present in the set

```
In [504... if 'eleven' in myset:  
            print('eleven is present in the set')  
else:  
            print('eleven is not present in the set')
```

eleven is not present in the set

```
In [505... #Add, Update, Discard, Clear, Delete & Remove Items
```

```
In [506... myset
```

```
Out[506... {'eight', 'five', 'four', 'one', 'seven', 'six', 'three', 'two'}
```

```
In [507... myset.add('NINE')  
myset
```

```
Out[507... {'NINE', 'eight', 'five', 'four', 'one', 'seven', 'six', 'three', 'two'}
```

```
In [508... myset.update(['TEN' , 'ELEVEN' , 'TWELVE'])  
myset
```

```
Out[508... {'ELEVEN',  
            'NINE',  
            'TEN',  
            'TWELVE',  
            'eight',  
            'five',  
            'four',  
            'one',  
            'seven',  
            'six',  
            'three',  
            'two'}
```

```
In [509... myset.remove('NINE')  
myset
```

```
Out[509... {'ELEVEN',  
            'TEN',  
            'TWELVE',  
            'eight',  
            'five',  
            'four',  
            'one',  
            'seven',  
            'six',  
            'three',  
            'two'}
```

```
In [510... myset.discard('TEN')  
myset
```

```
Out[510...] {'ELEVEN',
             'TWELVE',
             'eight',
             'five',
             'four',
             'one',
             'seven',
             'six',
             'three',
             'two'}
```

```
In [511...] myset.clear()
myset
```

```
Out[511...] set()
```

```
In [512...] del myset
myset
```

```
-----
NameError                                Traceback (most recent call last)
Cell In[512], line 2
      1 del myset
----> 2 myset

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

```
In [513...] #Copy Set
```

```
In [514...] myset = {'one', 'two', 'three', 'four', 'five', 'six', 'seven', 'eight'}
myset
```

```
Out[514...] {'eight', 'five', 'four', 'one', 'seven', 'six', 'three', 'two'}
```

```
In [515...] myset1 = myset
myset1
```

```
Out[515...] {'eight', 'five', 'four', 'one', 'seven', 'six', 'three', 'two'}
```

```
In [516...] #Set Operation
```

```
In [517...] A = {1,2,3,4,5}
B = {4,5,6,7,8}
C = {8,9,10}
```

```
In [518...] A.union(B)
```

```
Out[518...] {1, 2, 3, 4, 5, 6, 7, 8}
```

```
In [519...] A.union(B, C)
```

```
Out[519...] {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
```

```
In [520...] A | B
```

```
Out[520...] {1, 2, 3, 4, 5, 6, 7, 8}
```

```
In [521... A.intersection(B)
```

```
Out[521... {4, 5}
```

```
In [522... A & B
```

```
Out[522... {4, 5}
```

```
In [523... A.difference(B)
```

```
Out[523... {1, 2, 3}
```

```
In [524... A - B
```

```
Out[524... {1, 2, 3}
```

```
In [525... B - A
```

```
Out[525... {6, 7, 8}
```

```
In [526... A.symmetric_difference(B)
```

```
Out[526... {1, 2, 3, 6, 7, 8}
```

```
In [527... A
```

```
Out[527... {1, 2, 3, 4, 5}
```

```
In [528... B
```

```
Out[528... {4, 5, 6, 7, 8}
```

```
In [529... A ^ B
```

```
Out[529... {1, 2, 3, 6, 7, 8}
```

```
In [530... #Subset , Superset & Disjoint
```

```
In [531... A = {1,2,3,4,5,6,7,8,9}  
B = {3,4,5,6,7,8}  
C = {10,20,30,40}
```

```
In [532... B.issubset(A)
```

```
Out[532... True
```

```
In [533... A.issuperset(B)
```

```
Out[533... True
```

```
In [534... C.isdisjoint(A)
```

```
Out[534... True
```

```
In [535... #Other Built-in functions
```

In [536...

A

Out[536...

{1, 2, 3, 4, 5, 6, 7, 8, 9}

In [537...

sum(A)

Out[537...

45

In [538...

max(A)

Out[538...

9

In [539...

min(A)

Out[539...

1

In [540...

len(A)

Out[540...

9

In [541...

list(enumerate(A))

```
-----  
TypeError                                Traceback (most recent call last)  
Cell In[541], line 1  
----> 1 list(enumerate(A))  
  
TypeError: 'list' object is not callable
```

In [542...

```
D= sorted(A,reverse=True)  
D
```

Out[542...

[9, 8, 7, 6, 5, 4, 3, 2, 1]

In [543...

sorted(D)

Out[543...

[1, 2, 3, 4, 5, 6, 7, 8, 9]

DICTIONARY

In [544...

#Create Dictionary

In [545...

```
mydict = dict()  
mydict
```

Out[545...

{}

In [546...

```
mydict = {}  
mydict
```

Out[546...

{}

In [547...

```
mydict = {1:'one' , 2:'two' , 3:'three'}
```



```
In [548... mydict.keys()
```

```
Out[548... dict_keys([1, 2, 3])
```

```
In [549... mydict.values()
```

```
Out[549... dict_values(['one', 'two', 'three'])
```

```
In [550... mydict.items()
```

```
Out[550... dict_items([(1, 'one'), (2, 'two'), (3, 'three')])
```

```
In [551... # Create a dictionary from a sequence of keys
```

```
In [552... keys = {'a' , 'b' , 'c' , 'd'}  
mydict3 = dict.fromkeys(keys)  
mydict3
```

```
Out[552... {'d': None, 'a': None, 'b': None, 'c': None}
```

```
In [553... keys = {'a' , 'b' , 'c' , 'd'}  
value = 10  
mydict3 = dict.fromkeys(keys , value)  
mydict3
```

```
Out[553... {'d': 10, 'a': 10, 'b': 10, 'c': 10}
```

```
In [554... keys = {'a' , 'b' , 'c' , 'd'}  
value = [10,20,30]  
mydict3 = dict.fromkeys(keys , value)  
mydict3
```

```
Out[554... {'d': [10, 20, 30], 'a': [10, 20, 30], 'b': [10, 20, 30], 'c': [10, 20, 30]}
```

```
In [555... value.append(40) #append fuction is used to add another value into dict  
mydict3
```

```
Out[555... {'d': [10, 20, 30, 40],  
          'a': [10, 20, 30, 40],  
          'b': [10, 20, 30, 40],  
          'c': [10, 20, 30, 40]}
```

```
In [556... #Accessing Items
```

```
In [557... mydict = {1:'one' , 2:'two' , 3:'three' , 4:'four'}  
mydict
```

```
Out[557... {1: 'one', 2: 'two', 3: 'three', 4: 'four'}
```

```
In [558... mydict[1]
```

```
Out[558... 'one'
```

```
In [559... # Access item using get() method
```

```
In [560... mydict.get(1)
```

Out[560... 'one'

```
In [561... mydict1 = {'Name':'Asif' , 'ID': 74123 , 'DOB': 1991 , 'job' : 'Analyst'}
mydict1
```

Out[561... {'Name': 'Asif', 'ID': 74123, 'DOB': 1991, 'job': 'Analyst'}

```
In [562... mydict1['Name']
```

Out[562... 'Asif'

```
In [563... # Change, Update, Add, Remove, Delete, Pop, Popitem & Clear Items
```

```
In [564... mydict1 = {'Name':'Asif' , 'ID': 12345 , 'DOB': 1991 , 'Address' : 'Hilsinki'}
mydict1
```

Out[564... {'Name': 'Asif', 'ID': 12345, 'DOB': 1991, 'Address': 'Hilsinki'}

```
In [565... mydict1['DOB'] = 1992
mydict1['Address'] = Delhi
mydict1
```

```
-----
NameError                                Traceback (most recent call last)
Cell In[565], line 2
      1 mydict1['DOB'] = 1992
----> 2 mydict1['Address'] = Delhi
      3 mydict1

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

```
In [566... dict1 = {'DOB':1995}
mydict1.update(dict1)
mydict1
```

Out[566... {'Name': 'Asif', 'ID': 12345, 'DOB': 1995, 'Address': 'Hilsinki'}

```
In [567... mydict1['Job'] = Analyst
mydict1
```

```
-----
NameError                                Traceback (most recent call last)
Cell In[567], line 1
----> 1 mydict1['Job'] = Analyst
      2 mydict1

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

```
In [568... mydict1.pop('Job')
mydict1
```

```
-----
KeyError                                Traceback (most recent call last)
Cell In[568], line 1
----> 1 mydict1.pop('Job')
      2 mydict1

KeyError: 'Job'
```

```
In [569... mydict1.popitem()
```

```
Out[569... ('Address', 'Hilsinki')
```

```
In [570... mydict1
```

```
Out[570... {'Name': 'Asif', 'ID': 12345, 'DOB': 1995}
```

```
In [571... del[mydict1['ID']]  
mydict1
```

```
Out[571... {'Name': 'Asif', 'DOB': 1995}
```

```
In [572... mydict1.clear()  
mydict1
```

```
Out[572... {}
```

```
In [573... del mydict1  
mydict1
```

```
-----  
NameError                                Traceback (most recent call last)  
Cell In[573], line 2  
      1 del mydict1  
----> 2 mydict1  
  
NameError: name 'mydict1' is not defined
```

```
In [574... #Copy Dictionary
```

```
In [575... mydict = {'Name':'Asif' , 'ID': 12345 , 'DOB': 1991 , 'Address' : 'Hilsinki'}  
mydict
```

```
Out[575... {'Name': 'Asif', 'ID': 12345, 'DOB': 1991, 'Address': 'Hilsinki'}
```

```
In [576... mydict1 = mydict  
mydict1
```

```
Out[576... {'Name': 'Asif', 'ID': 12345, 'DOB': 1991, 'Address': 'Hilsinki'}
```

```
In [577... mydict2 = mydict.copy()  
mydict2
```

```
Out[577... {'Name': 'Asif', 'ID': 12345, 'DOB': 1991, 'Address': 'Hilsinki'}
```

```
In [578... # Loop through a Dictionary
```

```
In [579... mydict1 = {'Name':'Asif' , 'ID': 12345 , 'DOB': 1991 , 'Address' : 'Hilsinki' ,  
mydict1
```

```
Out[579... {'Name': 'Asif',  
          'ID': 12345,  
          'DOB': 1991,  
          'Address': 'Hilsinki',  
          'Job': 'Analyst'}
```

```
In [580... for i in mydict1:  
            print(i , ':' , mydict1[i])
```

Name : Asif
ID : 12345
DOB : 1991
Address : Hilsinki
Job : Analyst

```
In [581... for i in mydict1:  
            print(mydict1[i])
```

Asif
12345
1991
Hilsinki
Analyst

```
In [582... #Dictionary Membership
```

```
In [583... mydict1 = {'Name':'Asif' , 'ID': 12345 , 'DOB': 1991 , 'Job': 'Analyst'}  
mydict1
```

```
Out[583... {'Name': 'Asif', 'ID': 12345, 'DOB': 1991, 'Job': 'Analyst'}
```

```
In [584... 'Name' in mydict1
```

```
Out[584... True
```

```
In [585... 'Asif' in mydict1
```

```
Out[585... False
```

```
In [586... 'ID' in mydict1
```

```
Out[586... True
```

```
In [587... 'Address' in mydict1
```

```
Out[587... False
```

```
In [588... #ALL / Any
```

```
In [589... mydict1 = {'Name':'Asif' , 'ID': 12345 , 'DOB': 1991 , 'Job': 'Analyst'}  
mydict1
```

```
Out[589... {'Name': 'Asif', 'ID': 12345, 'DOB': 1991, 'Job': 'Analyst'}
```

```
In [590... all(mydict1)
```

```
Out[590... True
```

```
In [592... any(mydict1)
```

```
Out[592... True
```