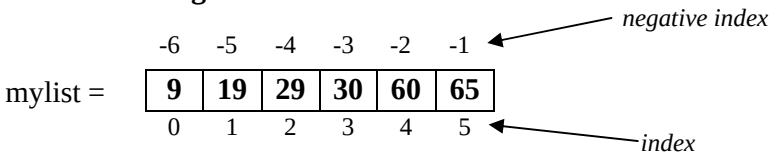
7. LIST MANIPULATION

List in python used to store sequence of items belonging to any type.
[ ] Square brackets are used in list
Each item is separated by comma
List are mutable (elements in a list can be changed)

Consider the following list



index - from left hand side
starts from 0 to size – 1
negative index - start right
from -1 to –(size)

Creating List

```
List1 = [10, 15, 20, 25, 30]
List2 = ['a', 'e', 'I', 'o', 'u']
List3 = [2202, "Amit", 25, "India", "Pass", 25.6]
List4 = ["MP", "UP", "CG", "AP"]

List5 = list("kvs")
List5                          # ['k', 'v', 's']
```

Access an item from a list

Item in a list can be access by using its either index number or negative index number

```
ListA = [8, 19, 23, 47]
ListA[0]                       # 8
ListA[2]                       # 23
ListA[-2]                      # 23
```

Iteration through a list

```
ListB = [2, 4, 8, 10]
for i in range(0, len(listB)) :
        print(listB[i])
```

O/p
2
4
8
10

Slicing of a list

```
ListC = ["I", "N", "I", "D", "I", "A"]
ListC[0 : 3]                   # ['I', 'N', 'D']
ListC[1 : 4]                   # [ 'N', 'D', 'I']
ListC[ : ]
ListC                          Both will give same result

                               # [ 'I', 'N', 'D', 'I', 'A']
```

Updating a list

Single or Multiple elements can be updated.

```
ListD = [36, 46, 56, 66, 76]
ListD[2]                    # 56
ListD[2] = 1000             # 56
ListD[2]                    # 1000
ListD                       # [36, 46, 1000, 66, 76]
ListD[2:3]= 400,500         # [36, 46, 400, 500, 66, 76]
```

Add an item to a list

There are two ways to add an item to a list

a. Using append
b. Using Extend

Using append : It is used to **add only one** item at a time

Using Extend : It is used to **add one or more item** (Multiple items)at a time

Append command		Extend command	
ListF = [44, 55]		ListF = [44, 55]	
List F	# [44, 55]	List F	# [44, 55]
ListF.append(77)		ListF.extend(77)	# Error
ListF	# [44, 55, 77]		
		ListF.extend([77])	# [44, 55, 77]
ListF.append(88,88)	# Error		
		ListF.append([88, 99])	# [44, 55, 77, 88, 99]

Add Two Lists

Two or more lists can be added.

```
ListM = [8, 9, 10]
ListN = [20, 30]

List1 = ListM + listN
List1                       # [8, 9, 10, 20, 30]

List2 = ListN + listM
List2                       # [20, 30, 8, 9, 10]

ListP = [100,200 ]
List4 = ListP + ListM + ListN   # [100, 200, 8, 9, 10, 20, 30]
```

Delete an item from a List

One or more items is possible to delete from a list.

```
ListB = [11, 21, 31, 41, 51]
del listB[1]                # [11, 31, 41, 51]
del ListB[0 : 2]            # used to delete first 2 items from list
                            # [41, 51]
del ListB                   # Delete the entire list
ListB                       # Error
```

"*" Command in a List

"*" function used in a list to repeat the item of list

```
ListC = [21, 31, 41]
ListC                    # [21, 31, 41]
ListC  * 3               # [21, 31, 41, 21, 31, 41, 21, 31, 41 ]
```

Whether item present in a List

in - return **True** if item present in the list otherwise return **False**

not in - return **True** if item is not available in the list otherwise return **True**

```
ListC = [21, 31, 41]
10 in ListC              # False
31 in ListC              # True

15 not in ListC          # True
41 not in ListC          # False
```

Sequence

```
List1 = list("good")
List1                    # ['g', 'o', 'o',  'd']

List2 = list(input('Enter the list of elements : '))
                Enter the list of Elements : 23456
List2                    # ['2', '3', '4', '5', '6'] as string
```

FUNCTIONS

a. insert( )

this function is used to insert an item to the list at desired index position.

```
ListC = [21, 31, 41, 51, 61, 71]
listC.insert(2, 100)          # [21, 31, 100, 41, 51, 61, 71]
```

b. remove( )

Function is used to remove an item from the list, argument will be item

```
ListC = [21, 31, 41, 51, 61, 71]
listC.remove(41)              # [21, 31, 51, 61, 71]
```

c. pop( )

Function is used to remove an item from the list, argument will be index number

```
ListC = [21, 31, 41, 51, 61, 71]
listC.pop(3)                  # 51
listC                         # [21, 31, 61, 71]
```

d. index( )

Function return the index number of any item available in the list

```
ListC = [21, 31, 41, 51, 61, 71]
listC.index(51)               # 3  (index number of 51 is 3)
```

e. clear( )

Function is used to remove all items from list or make the list empty.
List will be existed.

```
ListC = [21, 31, 41, 51, 61, 71]
listC.clear( )                # [ ]
```

f. count( )

Function is used to count the number of occurrence of any element in a list.

```
ListC = [1, 3, 5, 1, 7, 2, 1, 7]
listC.count(1)          # 3
listC.count(7)          # 2
listC.count(100)        # 0
```

g. max( )

Return the maximum item value in a list of items

```
ListC = [1, 3, 5, 1, 17, 2, 1, 7]
max(ListC )             # 17
```

h. min( )

Return the maximum item value in a list of items

```
ListC = [1, 3, 5, 1, 17, 2, 1, 7]
min(ListC )             # 1
```

i. len( )

count the number of element available to the list

```
ListC = [11, 22, 33, 44, 55]
len(ListC )             # 5

ListB = [“Ram”, “Kamal”, “Anuj”]
ListB                   # [‘Ram’, ‘Kamal’, ‘Anuj’]
len(ListB)              # 3
```

j. reverse( )

show the list of items in reverse order

```
ListC = [11, 22, 33, 44, 55]
ListC.reverse( )
ListC                   # 55, 44, 33, 22, 11
```

k. sort( )

arrange the list of item in an order

```
ListD = [4, 6, 2, 8, 1, 3, 11]
ListC.sort( )
ListC                   # 1, 2, 3, 4, 6, 8, 11
```