List

#Creation of list:-

In [1]:

```
#empty list
l=[]
print(type(l))
```

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

In [3]:

```
#if we know the data
l=[1,2,3]
print(type(l))
print(l)
```

```
<class 'list'>
[1, 2, 3]
```

In [4]:

```
#dynamic input:
l=eval(input("enter list:"))
print(l)
print(type(l))
```

```
enter list:[1,3,4,5]
[1, 3, 4, 5]
<class 'list'>
```

In [6]:

```
#by using list function:
s='akhil'
l=list(s)
print(l)
```

```
['a', 'k', 'h', 'i', 'l']
```

In [7]:

```
l=list(range(0,5))
print(l)
```

```
[0, 1, 2, 3, 4]
```

In [8]:

```
#split()
s="Learning python is easy"
l=s.split()
print(l)
```

```
['Learning', 'python', 'is', 'easy']
```

Accessing elements in the list:-

In [11]:

```
l=[10,20,30,40]
print(l[-1])
print(l[2])
print(l[-4])
#=====>print(l[300])===>IndexError
```

```
40
30
10
```

In [12]:

```
#by using slicing
l=[10,20,30,40,50,60,70,80,90,100]
print(l[2:7])
```

```
[30, 40, 50, 60, 70]
```

In [13]:

```
print(l[2:7:2])
```

```
[30, 50, 70]
```

In [14]:

```
print(l[4:len(l):2])
```

```
[50, 70, 90]
```

In [22]:

```
print(l[-2:-7:-2])
```

```
[90, 70, 50]
```

In [26]:

```
print(l[len(l)-2:3:-2])
```

```
[90, 70, 50]
```

In [27]:

```
print(len(l))
```

```
10
```

In [31]:

```
print(l[8:3:-2])
```

```
[90, 70, 50]
```

In [32]:

```
print(l[1:0:2])
```

```
[]
```

In [33]:

```
print(l[::1])
```

```
[10, 20, 30, 40, 50, 60, 70, 80, 90, 100]
```

In [34]:

```
print(l[::-1])
```

```
[100, 90, 80, 70, 60, 50, 40, 30, 20, 10]
```

Traversing elements of list:-

In [37]:

```
l=[1,2,3,4,5,6,7,8,9,10]
#while loop:
i=0
while i<len(l):
    print(l[i],end=" ")
    i=i+1
```

```
1 2 3 4 5 6 7 8 9 10
```

In [40]:

```
#for loop
for i in l:
    print(i,end=" # ")
```

```
1 # 2 # 3 # 4 # 5 # 6 # 7 # 8 # 9 # 10 #
```

In [41]:

```
#to print only even numbers:
for i in l:
    if i%2==0:
        print(i,end=" ")
```

```
2 4 6 8 10
```

In [1]:

```
#to print elements of list index wise:
l=[10,20,30,40,50]
i=0
while i<len(l):
    print('the element present at +ve: {} index and at -ve: {} index is : {}'.format(i,
    i=i+1
```

```
the element present at +ve: 0 index and at -ve: -5 index is : 10
the element present at +ve: 1 index and at -ve: -4 index is : 20
the element present at +ve: 2 index and at -ve: -3 index is : 30
the element present at +ve: 3 index and at -ve: -2 index is : 40
the element present at +ve: 4 index and at -ve: -1 index is : 50
```

In [2]:

```
#Mathematical operators for list:
#concatination(+)
#Repetition operator(*)
l1=[1,2,3]
l2=[4,5,6]
l3=l1+l2
print(l3)
```

```
[1, 2, 3, 4, 5, 6]
```

In [5]:

```
l=[10,20,30]
l2=l+[40]
print(l2)
```

```
[10, 20, 30, 40]
```

In [6]:

```
l=[1,2,3]
l2=l*3
print(l2)
```

```
[1, 2, 3, 1, 2, 3, 1, 2, 3]
```

In [2]:

```
#Equality operators for list objects:
# ==,  !=
l1=["Dog","Cat","Lion","Tiger"]
l2=["Cat","Lion","Dog","Tiger"]
l3=["dog","cat","lion","tiger"]
l4=["Dog","Cat"]
l5=["Dog","Cat","Lion","Tiger"]
print(l1==l2)
print(l1==l4)
print(l1!=l3)
print(l1==l5)
```

```
False
False
True
True
```

In [5]:

```
#Relational Operators:-
#    <,<=,>,>=
l1=[1,2,3,4,5]
l2=[5,6,7,8]
print(l1<l2)
print(l1>l2)
print(l2>l1)
print(l1>=l2)
```

```
True
False
True
False
```

In [6]:

```
#Membership operators:-
#  in, not in
l=[10,20,30,40]
print(10 in l)
print(200 not in l)
print(4 in l)
```

```
True
True
False
```

In [9]:

```
#important methods and functions for list:-
l=[40,10,20,30]
print(len(l))
print(sorted(l))
```

```
4
[10, 20, 30, 40]
```

In [10]:

```
l.append(89)
```

In [11]:

```
print(l)
```

```
[40, 10, 20, 30, 89]
```

In [12]:

```
#count()
l=[10,20,30,40,10,10,20,30]
print(l.count(10))
print(l.count(40))
print(l.count(1))
```

```
3
1
0
```

In [16]:

```
#index()
l=[5,10,20,10,30,40,50]
print(l.index(10))
#print(l.index(1))=====>ValueError
print(l.index(50))
```

```
1
6
```

In [19]:

```
l=[10,20,30,40]
x=int(input("Enter a number:"))
if x in l:
    print(x,"index of the number is:",l.index(x))
else:
    print("The number is not present")
```

```
Enter a number:90
The number is not present
```

Manupulating elements of list:-

In [1]:

```
#append():-
l=[]
l.append(10)
l.append(20)
l.append(30)
l.append(40)
print(l)
```

```
[10, 20, 30, 40]
```

In [2]:

```
#add numbers which are divisible by 10 from 1-100
l=[]
for i in range(1,101):
    if i%10==0:
        l.append(i)
print(l)
```

```
[10, 20, 30, 40, 50, 60, 70, 80, 90, 100]
```

In [4]:

```
#insert():-
#l.inser(index,element)
l=[10,20,30,40,50]
l.insert(1,100)
print(l)
```

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

In [5]:

```
l=[10,20,30]
l.insert(100,90)
l.insert(-100,78)
print(l)
```

```
[78, 10, 20, 30, 90]
```

In [6]:

```
#extend():-
#l.extend(l2)
l1=[10,20,30,40]
l2=[50,60,70]
l1.extend(l2)
print(l1)
```

```
[10, 20, 30, 40, 50, 60, 70]
```

In [9]:

```
l1=[1,2,3,4]
l2=[5,6]
l1.append(l2)
print(l1)
print(len(l1))
```

```
[1, 2, 3, 4, [5, 6]]
5
```

In [11]:

```
l1=[1,2,3]
l1.append("abc")
print(l1)
print(len(l1))
```

```
[1, 2, 3, 'abc']
4
```

In [13]:

```
l1=[1,2,3,4,5]
l1.extend("ABC")
print(l1)
print(len(l1))
```

```
[1, 2, 3, 4, 5, 'A', 'B', 'C']
8
```

In [14]:

```
#l.remove(x):-
l=[10,20,30,40]
l.remove(30)
#l.remove(60)====>ValueError
print(l)
```

```
[10, 20, 40]
```

In [2]:

```
l=[1,2,3,4,5,6,7]
print("Before removal:",l)
x=int(input("Enter the number to remove:"))

if x in l:
    l.remove(x)
    print("After removal",l)
else:
    print("Entered number is not in the list")
```

```
Before removal: [1, 2, 3, 4, 5, 6, 7]
Enter the number to remove:7
After removal [1, 2, 3, 4, 5, 6]
```

In [4]:

```
#How to remove all occurences:
l=[1,2,3,4,1,1,1,2,3,4,5,6,3,3,2,2]
x=int(input("enter which element to remove:"))
for i in l:
    if x in l:
        l.remove(x)
print(l)
```

```
enter which element to remove:1
[2, 3, 4, 2, 3, 4, 5, 6, 3, 3, 2, 2]
```

In [9]:

```
#pop():-
#l.pop()
l=[1,2,3]
print(l.pop())
print(l)
print(l.pop())
print(l.pop())
print(l)
#print(l.pop())=======>IndexError
```

```
3
[1, 2]
2
1
[]
```

In [11]:

```
#l.pop(index):-
l=[1,2,3,4,5,6]
l.pop(0)
print(l)
#l.pop(100)======IndexError
```

```
[2, 3, 4, 5, 6]
```

In [12]:

```
#clear():-
l=[1,2,3,4,5]
l.clear()
print(l)
```

```
[]
```

Ordering elements of list:-

In [13]:

```
#Reversing order:-
#l.reverse()
l=[1,2,3,4,5,6]
l.reverse()
print(l)
```

```
[6, 5, 4, 3, 2, 1]
```

In [14]:

```
#reversed()
l=[1,2,3,4,5]
r=reversed(l)
print(l)
print(r)
```

```
[1, 2, 3, 4, 5]
<list_reverseiterator object at 0x000002754E69E3A0>
```

In [15]:

```
#sorting elements of list:
#l.sort()
l=[49,48,1,2,34,0]
l.sort()
print(l)
```

```
[0, 1, 2, 34, 48, 49]
```

In [16]:

```
l=['a','A','r','K']
l.sort()
print(l)
```

```
['A', 'K', 'a', 'r']
```

In [18]:

```
#descending order:-
l=[5,3,6,7,9,1,33]
l.sort(reverse=True)
print(l)
```

```
[33, 9, 7, 6, 5, 3, 1]
```

In [22]:

```
#sorted(x):-
l1=[5,1,2,3,4]
l2=sorted(l1)
print(l2)
l1.sort()
print(l1)
```

```
[1, 2, 3, 4, 5]
[1, 2, 3, 4, 5]
```

In [25]:

```
#Aliasing and cloning of list object:-
l=[10,20,30,40]
l2=l
l[1]=99
print(l2)
print(l)
```

```
[10, 99, 30, 40]
[10, 99, 30, 40]
```

In [28]:

```
#Cloning:-
l1=[1,2,3,4,5]
l2=l1.copy()
l1[1]=20
print(id(l1))
print(id(l2))
print(l1)
print(l2)
```

```
2702850028032
2702850027392
[1, 20, 3, 4, 5]
[1, 2, 3, 4, 5]
```

In [30]:

```
#Nested list:-
l=[10,20,30,[50,60]]
print(l[0])
print(l[3][1])
```

```
10
60
```

In [1]:

```
#Nested list as matrix:-
l=[[1,2,3],[4,5,6],[7,8,9]]
print("Elements Row Wise:")
for i in l:
    for j in i:
        print(j,end=" ")
    print()
```

```
Elements Row Wise:
1 2 3
4 5 6
7 8 9
```

In [3]:

```
#List comprehension:-
l=[i for i in range(1,11)]
print(l)
```

```
[1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
```

In [4]:

```
#syntax=====>   l=[expression for each_element in sequence]
#Another one =======> l=[expression for each_element in sequence if conditon]
l=[i**2 for i in range(1,11)]
print(l)
```

```
[1, 4, 9, 16, 25, 36, 49, 64, 81, 100]
```

In [7]:

```
l=[x for x in range(1,101) if x%10==0]
print(l)
```

```
[10, 20, 30, 40, 50, 60, 70, 80, 90, 100]
```

In [16]:

```
#Create list with elements present in l1 but not l2
l1=[10,20,30,40]
l2=[30,40,50,60]
l3=[x for x in l1 if x not in l2]
print(l3)
```

```
[10, 20]
```

In [17]:

```
#create list with elements present in both l1 and l2
l4=[x for x in l2 if x in l1]
print(l4)
```

```
[30, 40]
```

In [19]:

```
l=[x for x in l1]
print(l)

```

```
[10, 20, 30, 40]
```

In [20]:

```
s="the quick brown fox jumbps over the lazy dog"
words=s.split()
print(words)
```

```
['the', 'quick', 'brown', 'fox', 'jumbps', 'over', 'the', 'lazy', 'dog']
```

In [21]:

```
l=[[word.upper(),len(word)] for word in words ]
print(l)
```

```
[['THE', 3], ['QUICK', 5], ['BROWN', 5], ['FOX', 3], ['JUMBPS', 6], ['OVER',
4], ['THE', 3], ['LAZY', 4], ['DOG', 3]]
```

In [24]:

```
#Program to display unique vowels present in the given word?
vowels=["a",'e','i','o','u']
words=input("Enter any word:")
result=[]
for ch in words:
    if ch in vowels:
        if ch not in result:
            result.append(ch)
print(result)
```

```
Enter any word:akhil
['a', 'i']
```

In [26]:

```
#another logic
vowels=["a",'e','i','o','u']
words=input("Enter any word:")
result=[]
for ch in vowels:
    if ch in words:
        result.append(ch)
print(result)
```

```
Enter any word:akhil
['a', 'i']
```

In [3]:

```
#another logic
vowels=["a",'e','i','o','u']
words=input("Enter any word:")
result=[ch for ch in vowels if ch in words]
print(result)
```

```
Enter any word:akhilakhil
['a', 'i']
```

In [4]:

```
print(result)
```

```
['a', 'i']
```

In [ ]:

```

```