Lists

September 25, 2024

[2]:
```
list1 = ['Asif', 25 ,[50, 100],[150, 90] , {'John' , 'David'}] # nested list and set
```

[3]:
```
len(list1)
```

[3]: 5

[4]:
```
list1[2]
```

[4]: [50, 100]

[5]:
```
list1[0][0]#Access the first indexing and the first character
```

[5]: 'A'

[6]:
```
list1[2][0]
```

[6]: 50

[7]:
```
list1[3][1]
```

[7]: 90

[8]:
```
list1[4][1]
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-8-8c32e6fe06b0> in <module>
----> 1 list1[4][1]

TypeError: 'set' object is not subscriptable
```

[9]:
```
list1[-1]
```

[9]: {'David', 'John'}

[10]:
```
list1[-2][0]
```

[10]:
```
150
```

[11]:
```
list2=[15,30,4.5,"Hello",'car',1,3,5,"eight"]
```

[12]:
```
len(list2)
```

[12]:
```
9
```

[13]:
```
list2[:]
```

[13]:
```
[15, 30, 4.5, 'Hello', 'car', 1, 3, 5, 'eight']
```

[14]:
```
list2[1:5]
```

[14]:
```
[30, 4.5, 'Hello', 'car']
```

[15]:
```
list2[:3]
```

[15]:
```
[15, 30, 4.5]
```

[16]:
```
list2[5:]
```

[16]:
```
[1, 3, 5, 'eight']
```

[17]:
```
list2[-2]
```

[17]:
```
5
```

[18]:
```
list2[-3:]
```

[18]:
```
[3, 5, 'eight']
```

[19]:
```
list2[:-2]
```

[19]:
```
[15, 30, 4.5, 'Hello', 'car', 1, 3]
```

[20]:
```
list2
```

[20]:
```
[15, 30, 4.5, 'Hello', 'car', 1, 3, 5, 'eight']
```

[21]:
```
len(list2)
```

[21]:
```
9
```

[24]:
```
list2.append("ten")#appends at the end of the list
list2
```

[24]:
```
[15, 30, 4.5, 'Hello', 'car', 1, 3, 5, 'eight', 'ten', 'ten', 'ten']
```

[25]:
```
list3=["welcome","great","harry",40.5]
```

[26]:
```
len(list3)
```

[26]:
```
4
```

[27]:
```
list3.append(5)
list3
```

[27]:
```
['welcome', 'great', 'harry', 40.5, 5]
```

[28]:
```
list3.append("raj")
list3
```

[28]:
```
['welcome', 'great', 'harry', 40.5, 5, 'raj']
```

[29]:
```
list3.insert(2,9)
list3
```

[29]:
```
['welcome', 'great', 9, 'harry', 40.5, 5, 'raj']
```

[30]:
```
list3.insert(7,"seven")
list3
```

[30]:
```
['welcome', 'great', 9, 'harry', 40.5, 5, 'raj', 'seven']
```

[31]:
```
list3.insert(0,0)
```

[32]:
```
list3
```

[32]:
```
[0, 'welcome', 'great', 9, 'harry', 40.5, 5, 'raj', 'seven']
```

[33]:
```
list3.insert(-1,2.5)
list3
```

[33]:
```
[0, 'welcome', 'great', 9, 'harry', 40.5, 5, 'raj', 2.5, 'seven']
```

[34]:
```
list3.insert(1,[20,50])
list3
```

[34]:
```
[0, [20, 50], 'welcome', 'great', 9, 'harry', 40.5, 5, 'raj', 2.5, 'seven']
```

[35]:
```
list3.insert(-1,{"one",2,"three"})
list3
```

[35]:
```
[0,
 [20, 50],
 'welcome',
 'great',
```

```
 9,
 'harry',
 40.5,
 5,
 'raj',
 2.5,
 {2, 'one', 'three'},
 'seven']
```

[36]:
```
list3.remove(0)
list3
```

[36]:
```
[[20, 50],
 'welcome',
 'great',
 9,
 'harry',
 40.5,
 5,
 'raj',
 2.5,
 {2, 'one', 'three'},
 'seven']
```

[37]:
```
list3.remove("welcome")
list3
```

[37]:
```
[[20, 50],
 'great',
 9,
 'harry',
 40.5,
 5,
 'raj',
 2.5,
 {2, 'one', 'three'},
 'seven']
```

[38]:
```
list3.pop()#removes last item of the list. syntax: pop(index),
#remove(value): removes the first occurence of the value from the list
list3
```

[38]:
```
[[20, 50], 'great', 9, 'harry', 40.5, 5, 'raj', 2.5, {2, 'one', 'three'}]
```

[39]:
```
list3.pop(2)
list3
```

[39]:
```
[[20, 50], 'great', 'harry', 40.5, 5, 'raj', 2.5, {2, 'one', 'three'}]
```

[40]:
```
del list3[2]# Remove item at index location 2
list3
```

[40]:
```
[[20, 50], 'great', 40.5, 5, 'raj', 2.5, {2, 'one', 'three'}]
```

[41]:
```
#change the value of the index in the list
list3[1]=1
list3[2]=15
list3[3]=["hi","hello"]
list3
```

[41]:
```
[[20, 50], 1, 15, ['hi', 'hello'], 'raj', 2.5, {2, 'one', 'three'}]
```

[42]:
```
list3.clear()
list3
```

[42]:
```
[]
```

[43]:
```
list2
```

[43]:
```
[15, 30, 4.5, 'Hello', 'car', 1, 3, 5, 'eight', 'ten', 'ten', 'ten']
```

[44]:
```
list3=list2 # Create a new reference "mylist1"
```

[45]:
```
id(list2),id(list3)
```

[45]:
```
(2135894053888, 2135894053888)
```

[46]:
```
list4=list2.copy() # Create a copy of the list
```

[47]:
```
id(list4)
```

[47]:
```
2135893312192
```

[48]:
```
list2
```

[48]:
```
[15, 30, 4.5, 'Hello', 'car', 1, 3, 5, 'eight', 'ten', 'ten', 'ten']
```

[49]:
```
list2[3]="Welcome"
list2
```

[49]:
```
[15, 30, 4.5, 'Welcome', 'car', 1, 3, 5, 'eight', 'ten', 'ten', 'ten']
```

[50]:
```
list3
```

[50]:
```
[15, 30, 4.5, 'Welcome', 'car', 1, 3, 5, 'eight', 'ten', 'ten', 'ten']
```

[51]:
```
list4
```

[51]: [15, 30, 4.5, 'Hello', 'car', 1, 3, 5, 'eight', 'ten', 'ten', 'ten']

[4]:
```
list1
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
<ipython-input-4-32e3a55f6bef> in <module>
----> 1 list1

NameError: name 'list1' is not defined
```

[53]:
```
list2
```

[53]: [15, 30, 4.5, 'Welcome', 'car', 1, 3, 5, 'eight', 'ten', 'ten', 'ten']

[54]:
```
list5=list1+list2 # Join two lists by '+' operator
list5
```

[54]:
```
['Asif',
 25,
 [50, 100],
 [150, 90],
 {'David', 'John'},
 15,
 30,
 4.5,
 'Welcome',
 'car',
 1,
 3,
 5,
 'eight',
 'ten',
 'ten',
 'ten']
```

[55]:
```
list1.extend(list2)
```

[5]:
```
list1=[1,"ram",2.5,10,3,"six",("sell","car",3),11]
```

[6]:
```
six in list1
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
<ipython-input-6-87781f92d9f4> in <module>
----> 1 six in list1
```

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

[7]:
```
list1
```

[7]:
```
[1, 'ram', 2.5, 10, 3, 'six', ('sell', 'car', 3), 11]
```

[14]:
```
list1.reverse()#reverse the list
list1
```

[14]:
```
[11, ('sell', 'car', 3), 'six', 3, 10, 2.5, 'ram', 1]
```

[8]:
```
"six" in list1
```

[8]:
```
True
```

[9]:
```
8 in list1
```

[9]:
```
False
```

[10]:
```
if 9 in list1:
    print("9 in list1")
else:
    print("9 is not in list1")
```

```
9 is not in list1
```

[16]:
```
list1[::-1] #list1[start:end:step] This also reverses the list without reverse()
```

[16]:
```
[1, 'ram', 2.5, 10, 3, 'six', ('sell', 'car', 3), 11]
```

[17]:
```
list1[::-3]
```

[17]:
```
[1, 10, ('sell', 'car', 3)]
```

[18]:
```
list1
```

[18]:
```
[11, ('sell', 'car', 3), 'six', 3, 10, 2.5, 'ram', 1]
```

[19]:
```
list1[::-3]
```

[19]:
```
[1, 10, ('sell', 'car', 3)]
```

[20]:
```
list2= [2,4,3,{8,10},9,[5.5,6.5]]
list2.sort()
list2
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-20-77013d1bf4b8> in <module>
      1 list2= [2,4,3,{8,10},9,[5.5,6.5]]
----> 2 list2.sort()
      3 list2

TypeError: '<' not supported between instances of 'set' and 'int'
```

[9]:
```
list1= [2,4,3,9,[5.5,6.5]]
list1.sort()
print(list1)
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-9-be70ad49a842> in <module>
      1 list1= [2,4,3,9,[5.5,6.5]]
----> 2 list1.sort()
      3 print(list1)

TypeError: '<' not supported between instances of 'list' and 'int'
```

[3]:
```
list3=[15,21,31,5,91,8]
list3.sort()
list3
```

[3]:
```
[5, 8, 15, 21, 31, 91]
```

[22]:
```
list4=[15,21,3.5,8,35]
list4.sort()
list4
```

[22]:
```
[3.5, 8, 15, 21, 35]
```

[23]:
```
list5=[15,21,3.5,8,35,"hello"]
list5.sort()
list5
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-23-d0005753d3be> in <module>
      1 list5=[15,21,3.5,8,35,"hello"]
----> 2 list5.sort()
      3 list5
```

```
TypeError: '<' not supported between instances of 'str' and 'int'
```

[24]:
```
list2
```

[24]:
```
[2, 3, 4, {8, 10}, 9, [5.5, 6.5]]
```

[25]:
```
list2 = [2, 4, 3, {8, 10}, 9, [5.5, 6.5]]

# Separate the elements by type
numbers = [x for x in list2 if isinstance(x, (int, float))]
sets = [x for x in list2 if isinstance(x, set)]
lists = [x for x in list2 if isinstance(x, list)]

# Sort only the numbers
numbers.sort()

# Output the sorted list of numbers
print("Sorted numbers:", numbers)
```

```
Sorted numbers: [2, 3, 4, 9]
```

[3]:
```
list3=[2,95,24,78,1,52,99]
list3.sort(reverse=True) # sort in descending order
list3
```

[3]:
```
[99, 95, 78, 52, 24, 2, 1]
```

[4]:
```
list4=[51,5,47,2,88,100]
sorted(list4)# Returns a new sorted list and doesn't change original list
```

[4]:
```
[2, 5, 47, 51, 88, 100]
```

[5]:
```
list4
```

[5]:
```
[51, 5, 47, 2, 88, 100]
```

[15]:
```
list5=["Hi",1,4.5,2,1,"Hi",4.5,"three","hi",2,8.9,"Hi",2,2,{"one","two"}]
list5.count("one")
```

[15]:
```
0
```

[11]:
```
list5.count(4.5)
```

[11]:
```
2
```

[12]:
```
list5.count(1)
```

[12]:
```
2
```

[16]:
```
list6=[1,2,0,5.8]
all(list6)
```

[16]:
```
False
```

[17]:
```
any(list6)
```

[17]:
```
True
```

[24]:
```
list7=[]
list8=[]
for i in range(1,11):
    list7.append(4*i)

for i in range(0,10):
    list8.append(list7[i]%5==0)
print(list7)
print(list8)
print(any(list8))
```

```
[4, 8, 12, 16, 20, 24, 28, 32, 36, 40]
[False, False, False, False, True, False, False, False, False, True]
True
```

[26]:
```
print(any([False,False,False]))
```

```
False
```

[29]:
```
print(any([True,False,False]))
```

```
True
```

[31]:
```
list9=[ch*4 for ch in "BETA"]
list9
```

[31]:
```
['BBBB', 'EEEE', 'TTTT', 'AAAA']
```

[32]:
```
list10=[i for i in range(200) if i%3==0 if i%7==1 if i%9==0]
list10
```

[32]:
```
[36, 99, 162]
```

[42]:
```
str="one 1 two 2 three 3"
numbers=[i for i in str if i.isdigit()]
alphabets=[i for i in str if i.isalpha()]
print(numbers)
print(alphabets)
```

```
['1', '2', '3']
['o', 'n', 'e', 't', 'w', 'o', 't', 'h', 'r', 'e', 'e']
```

[44]:
```
list(map(abs, [-1, -2, 0, 1, 2]))
```

[44]:
```
[1, 2, 0, 1, 2]
```

[45]:
```
list10
```

[45]:
```
[36, 99, 162]
```

[46]:
```
print(max(list10))
print(min(list10))
```

```
162
36
```

[49]:
```
list11 = ['ab','xc','df']
list12 = ['ab','xc',1]
print(max(list11))
print(max(list12))
```

```
xc
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-49-2e720edbd995> in <module>
      2 list12 = ['ab','xc',1]
      3 print(max(list11))
----> 4 print(max(list12))

TypeError: '>' not supported between instances of 'int' and 'str'
```

[52]:
```
import math
num1=[65,28,33]
num2=[25,33,11]
print(math.cmp(num1,num2))
print(math.cmp(num2,num1))
```

```
---------------------------------------------------------------------------
AttributeError                            Traceback (most recent call last)
<ipython-input-52-4b31a1d39b6f> in <module>
      2 num1=[65,28,33]
      3 num2=[25,33,11]
----> 4 print(math.cmp(num1,num2))
      5 print(math.cmp(num2,num1))

AttributeError: module 'math' has no attribute 'cmp'
```

[53]:
```
matrix = [[0 for x in range(3)] for x in range(3)]
print(matrix)
```

```
[[0, 0, 0], [0, 0, 0], [0, 0, 0]]
```

[58]:
```
matrix1 = [[1, 2, 3],[4, 5, 6],[7, 8, 9]]
matrix2=[[2, 3, 4],[5, 6, 7],[8, 9, 10]]
matrix = [[0 for x in range(3)] for x in range(3)]
print(matrix)
for i in range(0,len(matrix1)):
    for j in range(0,len(matrix1)):
        matrix[i][j]=matrix1[i][j]+matrix2[i][j]
print(matrix)
```

```
[[3, 5, 7], [9, 11, 13], [15, 17, 19]]
```

[62]:
```
matrix1 = [[1, 2, 3],[4, 5, 6],[7, 8, 9]]
matrix2=[[1, 2, 3],[4, 5, 6],[7, 8, 9]]
matrix3= [[0 for x in range(3)] for x in range(3)]
for i in range(0,len(matrix1)):
    for j in range(0,len(matrix1)):
        matrix3[i][j]=matrix1[i][j]+matrix2[i][j]
print(matrix3)
```

```
[[2, 4, 6], [8, 10, 12], [14, 16, 18]]
```

[65]:
```
a=[10,20,25,34,11,33,44,67,79,81]
n=len(a)
odd=[ ]
even=[ ]
for i in range(0,n):
    if(a[i]%2!=0):
        odd.append(a[i])
    else:
        even.append(a[i])
print(odd)
print(even)
```

```
[25, 11, 33, 67, 79, 81]
[10, 20, 34, 44]
```

[71]:
```
a=[10,20,25,34,11,33,44,67,79,81]
n=len(a)
odd=[i for i in a if (i%2!=0)]
even=[i for i in a if (i%2==0)]
print(odd)
print(even)
```

```
[25, 11, 33, 67, 79, 81]
[10, 20, 34, 44]
```

[81]:
```
n=int(input())
bucket=[]
red=green=blue=0
for i in range(0,n):
    colour = input("Enter the colour of the ball")
    bucket.append(colour)
print(bucket)
for i in range(0,n):
    if(bucket[i]=="red"):
        red=red+1
    elif(bucket[i]=="green"):
        green=green+1
    else:
        blue=blue+1
print("Number of Red color balls=",red)
print("Number of Green color balls=",green)
print("Number of Blue color balls=",blue)
```

```
4
Enter the colour of the ballred
Enter the colour of the ballgreen
Enter the colour of the ballblue
Enter the colour of the ballred
['red', 'green', 'blue', 'red']
Number of Red color balls= 2
Number of Green color balls= 1
Number of Blue color balls= 1
```

[82]:
```
elements = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
k1 = 4
k2 = 9

# Iterate through the list and print elements between k1 and k2
for x in elements:
    if k1 <= x <= k2:
        print(x, end=', ')
```

```
4, 5, 6, 7, 8, 9,
```

[ ]: