LIST

In [6]:
```
#Python program to interchange first and last elements in a list
def swap_list(a):
    temp=a[0]
    a[0]=a[-1]
    a[-1]=temp
    return a

a=[1, 2, 3,5,7,10]
print(swap_list(a))

#another approach
def swap_list(a):
    a[0],a[-1]=a[-1],a[0]
    return a
a=[1, 2, 3,5,7,10]
print(swap_list(a))
```

```
[10, 2, 3, 5, 7, 1]
[10, 2, 3, 5, 7, 1]
```

In [8]:
```
#Input : List = [1, 2, 3, 4, 5], pos1 = 1, pos2 = 3
#Output : [3, 2, 1, 4, 5]
List = [1, 2, 3, 4, 5]
val1=int(input('enter the 1st index: '))
val2=int(input('enter the 2nd index: '))

List[val1-1],List[val2-1]=List[val2-1],List[val1-1]
List
# another approach
def swapnum(list,pos1,pos2):
    list[pos1],list[pos2]=list[pos2],list[pos1]
    return list
list=[1, 2, 3,4,5]
pos1,pos2=1,3
swapnum(list,pos1-1,pos2-1)
```

```
enter the 1st index: 1
enter the 2nd index: 3
```

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

In [9]:
```
#Length of a List in Python, default=len(a)
a=[3, 2, 1, 4, 5]
size=0
for i in a:
    size+=1
size
```

Out[9]:
```
5
```

In [11]:
```
#Check if element exists in list in Python
a=[3, 2, 1, 4, 5]
i=3
if i in a:
    print('Yes')
else:
    print('No')
```

```
Yes
```

In [12]:
```
#clear a list in Python
a=[3, 2, 1, 4, 5]
a.clear()
a
```

Out[12]:
```
[]
```

In [16]:
```
#Reversing a list
lst=[4, 5, 6, 7, 8, 9]
rev=lst[::-1]
rev
```

Out[16]:
```
[9, 8, 7, 6, 5, 4]
```

In [18]:
```
# sum all elemenst in list
from functools import reduce
lst=[12, 15, 3, 10]

a=reduce(lambda x,y:x+y,lst)
a
```

Out[18]:
```
40
```

In [19]:
```
# multiply all ele in list
list1 = [3, 2, 4]
a=reduce(lambda x,y:x*y,list1)
a
```

Out[19]:
```
24
```

In [22]:
```
# print smallest ele in list, default use min(a)
a=[10, 20, 4]
mini=a[0]
for i in a:
    if i<mini:
        mini=i
print(mini)
```

```
4
```

In [23]:
```
# print largest ele in list, default use max(a)
a=[10, 20, 4]
maxi=a[0]
for i in a:
    if i>maxi:
        maxi=i
print(maxi)
```

```
20
```

In [27]:
```
# find second largest ele in list
a=[10, 20, 4]
a1=sorted(a)
a1[1]
```

Out[27]:
```
10
```

In [5]:
```
#Python program to find N largest elements from a list
#Input : [81, 52, 45, 10, 3, 2, 96]
#N = 3
#Output : [81, 96, 52]
list=[81, 52, 45, 10, 3, 2, 96]
val=int(input('enter the value: '))
list.sort(reverse=True)
list[:val]
```

```
enter the value: 4
```

Out[5]:
```
[96, 81, 52, 45]
```

In [7]:
```
#Python program to print even numbers in a list
a=[2, 7, 5, 64, 14]
res=[]
for i in a:
    if i%2==0:
        res.append(i)
print(res)
```

```
[2, 64, 14]
```

In [8]:
```
#Python program to print odd numbers in a list
a=[2, 7, 5, 64, 14]
res=[]
for i in a:
    if i%2!=0:
        res.append(i)
print(res)
```

```
[7, 5]
```

In [12]:
```
#Python program to print all even numbers in a range
#Input: start = 4, end = 15
#Output: 4, 6, 8, 10, 12, 14
val1=int(input('enter the start range: '))
val2=int(input('enter the end range: '))
res=[]
for i in range(val1,val2+1):
    if i%2==0:
        res.append(i)
print(res)
```

```
enter the start range: 4
enter the end range: 15
[4, 6, 8, 10, 12, 14]
```

In [13]:
```
#Python program to print all odd numbers in a range
start=int(input('enter start range: '))
end=int(input('enter end range: '))
res=[]
for i in range(start,end+1):
    if i%2!=0:
        res.append(i)
```

```
print(res)
```

```
enter start range: 4
enter end range: 15
[5, 7, 9, 11, 13, 15]
```

In [20]:
```
#Python program to print positive numbers in a list
list1 = [12, -7, 5, 64, -14]
def pos_num(list1):
    res=[]
    for i in list1:
        if i>0:
            res.append(i)
    print(res)
pos_num(list1)
# using list com
res=[i for i in list1 if i>0]
res
```

```
[12, 5, 64]
```
Out[20]:
```
[12, 5, 64]
```

In [21]:
```
#Python program to print negative numbers in a list
list1 = [12, -7, 5, 64, -14]
res=[i for i in list1 if i<0]
res
```

Out[21]:
```
[-7, -14]
```

In [23]:
```
#Python program to print all positive numbers in a range
#Input: start = -4, end = 5
#Output: 0, 1, 2, 3, 4, 5
start=int(input('enter start range: '))
end=int(input('enter end range: '))

res=[i for i in range(start,end+1) if i >=0]
res
```

```
enter start range: -4
enter end range: 5
```
Out[23]:
```
[0, 1, 2, 3, 4, 5]
```

In [24]:
```
#Python program to print all negative numbers in a range
start=int(input('enter start range: '))
end=int(input('enter end range: '))

res=[i for i in range(start,end+1) if i <0]
res
```

```
enter start range: -4
enter end range: 5
```
Out[24]:
```
[-4, -3, -2, -1]
```

In [29]:
```
#Remove multiple elements from a list in Python
list=[12, 15, 3, 10]
unwanted=[12,3]
res=[i for i in list if i not in unwanted]
res
```

Out[29]:
```
[15, 10]
```

In [31]:
```
# remove empty list from a list
test_list = [5, 6, [], 3, [], [], 9]
res=[i for i in test_list if i!=[]]
res
```

Out[31]:
```
[5, 6, 3, 9]
```

In [32]:
```
# shallow copy creates a copy of the object but references each element of the objects
import copy
list=[[1,2,3],[4,5,6],[7,8,9]]
new_list=copy.copy(list)

new_list[0]=['a','b','c']
#print(list)
#print(new_list)

new_list[0][2]='*'
print(list)
print(new_list)
```

```
[[1, 2, 3], [4, 5, 6], [7, 8, 9]]
[['a', 'b', '*'], [4, 5, 6], [7, 8, 9]]
```

In [33]:
```
# in deepcopy the element as well will be changed without changing in original list
list=[[1,2,3],[4,5,6],[7,8,9]]
```

```
new_list=copy.deepcopy(list)
new_list[0][2]='c'
print(list)
print(new_list)
# here the original list remains unchanged
```

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

In [37]:
```
#Count occurrences of an element in a list, default use .count(x) to get the op
lst = [15, 6, 7, 10, 12, 20, 10, 28, 10]
print(lst.count(10))
val= int(input('enter some val: '))
count=0
for i in lst:
    if i==val:
        count+=1
print(count)
```

```
3
enter some val: 10
3
```

In [38]:
```
# Remove empty tuples from a list
tuples = [(), ('ram','15','8'), (), ('laxman', 'sita'),
          ('krishna', 'akbar', '45'), ('',''),()]

res=[i for i in tuples if i !=()]
res
```

Out[38]:
```
[('ram', '15', '8'), ('laxman', 'sita'), ('krishna', 'akbar', '45'), ('', '')]
```

In [39]:
```
# Program to print duplicates from a list of integers
#Input :  list = [-1, 1, -1, 8]
#Output : output_list = [-1]
list = [-1, 1, -1, 8]
unique=[]
dup=[]
for i in list:
    if i not in unique:
        unique.append(i)
    else:
        dup.append(i)

print(dup)
```

```
[-1]
```

In [46]:
```
# cumulative sum of list
from functools import reduce
list = [10, 20, 30, 40, 50]
res=reduce(lambda x,y:x+y,list)
print(res)
# normal approach
op=0
for i in list:
    op+=i
print(op)
```

```
150
150
```

In [51]:
```
list=[12, 67, 98, 34]
final=[]
for i in list:
    num=i
    rem=num%10
    quo=num//10
    res=rem+quo
    final.append(res)
print(final)
```

```
[3, 13, 17, 7]
```

In [52]:
```
#Break a list into chunks of size N in Python using a loop
my_list = [1, 2, 3, 4, 5,
           6, 7, 8, 9]
start = 0
end = len(my_list)
step = 3
for i in range(start, end, step):
    x = i
    print(my_list[x:x+step])
```

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

In [ ]: