Marwadi University Marwadi Chandarana Group NAAC A+	**Marwadi University** **Faculty of Engineering & Technology** **Department of Information and Communication Technology**	
Subject: Programming With Python (01CT1309)	**Aim:** Write a python program to create, append and remove lists in python.	
Experiment No: 04	**Date: 28/07/25**	**Enrollment No:92400133037**

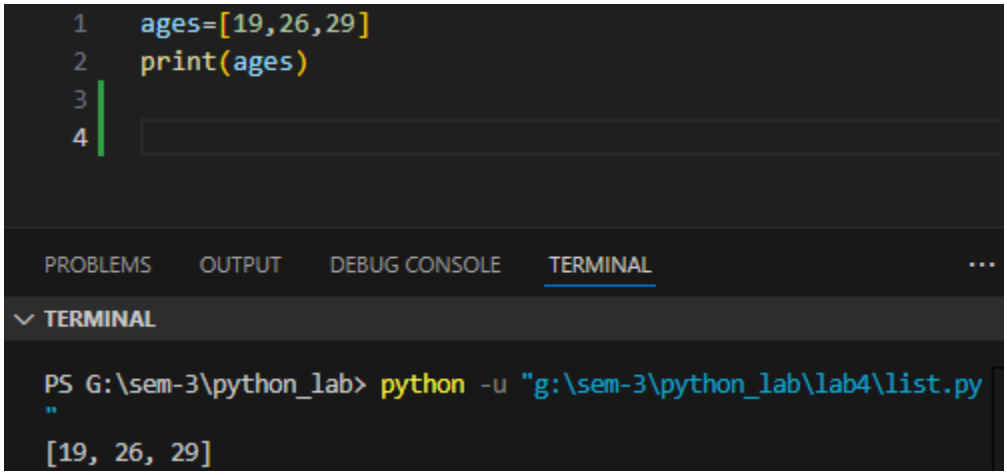
Aim: Write a python program to create, append and remove lists in python.

IDE:

A collection of items can be managed and stored in an ordered sequence using a Python list, a flexible and robust data structure. Because lists may hold components of several data types—integers, texts, and even other lists—they are incredibly versatile for various computer applications. You can quickly add, remove, and alter elements from Python lists and carry out operations like sorting and slicing.

Example of List in Python

ages = [19, 26, 29]
print(ages)
Output:



Task:

a = list(range(5))
print(a)
Output:

b = list(range(5,10))
print(b)
Output:

c = list(range(0,10,2))

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print(c)

d = list(range(10,0,-2))
print(d)
output:

```
lab4 > task.py > ...
1   a=list(range(5))
2   print(a)
3
4   b=list(range(5,10))
5   print(b)
6
7   c=list(range(0,10,2))
8   print(c)
9
10  d=list(range(10,0,-2))
11  print(d)

PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL
TERMINAL                                  Code

PS G:\sem-3\python_lab> python -u "g:\sem-3\python_lab\lab4\list.py"
[0, 1, 2, 3, 4]
[5, 6, 7, 8, 9]
[0, 2, 4, 6, 8]
[10, 8, 6, 4, 2]
```

Add Elements to a Python List

1. Python append() Method

Adds element to the end of a list.

List = ['Mathematics', 'chemistry', 1997, 2000]
List.append(20544)
print(List)
output

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```python
List=['Mathematics','chemistry',1997,2000]
List.append(20544)
print(List)

List.insert(2,10087)
print(List)

List1=[1,2,3]
List2=[2,3,4,5]
List1.extend(List2)
print(List1)
List2.extend(List1)
print(List2)
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL
TERMINAL                                  Code
PS G:\sem-3\python_lab> python -u "g:\sem-3\python_lab\lab4\list-oper.py"
['Mathematics', 'chemistry', 1997, 2000, 20544]
['Mathematics', 'chemistry', 10087, 1997, 2000, 20544]
[1, 2, 3, 2, 3, 4, 5]
[2, 3, 4, 5, 1, 2, 3, 2, 3, 4, 5]
```

2. Python insert() Method

Inserts an element at the specified position.

List = ['Mathematics', 'chemistry', 1997, 2000]
# Insert at index 2 value 10087
List.insert(2, 10087)
print(List)
output

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```python
List=['Mathematics','chemistry',1997,2000]
List.append(20544)
print(List)

List.insert(2,10087)
print(List)

List1=[1,2,3]
List2=[2,3,4,5]
List1.extend(List2)
print(List1)
List2.extend(List1)
print(List2)
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL
TERMINAL                                  Code
PS G:\sem-3\python_lab> python -u "g:\sem-3\python_lab\lab4\list-oper.py"
['Mathematics', 'chemistry', 1997, 2000, 20544]
['Mathematics', 'chemistry', 10087, 1997, 2000, 20544]
[1, 2, 3, 2, 3, 4, 5]
[2, 3, 4, 5, 1, 2, 3, 2, 3, 4, 5]
```

3. Python extend() Method

Adds items of an iterable(list.) to the end of a list.

List1 = [1, 2, 3]
List2 = [2, 3, 4, 5]
# Add List2 to List1
List1.extend(List2)
print(List1)
output:

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```python
List=['Mathematics','chemistry',1997,2000]
List.append(20544)
print(List)

List.insert(2,10087)
print(List)

List1=[1,2,3]
List2=[2,3,4,5]
List1.extend(List2)
print(List1)
List2.extend(List1)
print(List2)
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL
TERMINAL                                  Code
PS G:\sem-3\python_lab> python -u "g:\sem-3\python_lab\lab4\list-oper.py"
['Mathematics', 'chemistry', 1997, 2000, 20544]
['Mathematics', 'chemistry', 10087, 1997, 2000, 20544]
[1, 2, 3, 2, 3, 4, 5]
[2, 3, 4, 5, 1, 2, 3, 2, 3, 4, 5]
```

Important Functions of the Python List

1. Python sum() Method
Calculates the sum of all the elements of the List.

List = [1, 2, 3, 4, 5]
print(sum(List))
output

```python
list=[1,2,3,4,5]
print(sum(list))
```

```
PS G:\sem-3\python_lab> python -u "g:\sem-3\python_lab\lab4\list-fns.py
15
```

Task:
List = ['gfg', 'abc', 3]

print(sum(List))
Output

```
#List=['gfg','abc','3']
#print(sum(List))--type error
```

2. Python count() Method

Calculates the total occurrence of a given element of the List.

List = [1, 2, 3, 1, 2, 1, 2, 3, 2, 1]
print(List.count(1))

List = [‘a’,’b’,c’,’d’,’a’]
print(List.count(‘a’))
output:

lab4 > list-fns.py > ...

```
List=[1,2,3,1,2,1,2,3,2,1]
print(List.count(1))
List=['a','b','c','d','a']
print(List.count('a'))
print(List.count('e'))#--0
```

```
4
2
0
```

3. Python len() Method
Calculates the total length of the List.

List = [1, 2, 3, 1, 2, 1, 2, 3, 2, 1]
print(len(List))

4. Python index() Method

Returns the index of the first occurrence. The start and end indexes are not necessary parameters.

List = [1, 2, 3, 1, 2, 1, 2, 3, 2, 1]
print(List.index(2))

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Task:
List = [1, 2, 3, 1, 2, 1, 2, 3, 2, 1]
print(List.index(2, 2))
output

```
12  List=[1,2,3,1,2,1,2,3,2,1]
13  print(len(List))
14  print(List.index(2))
15  print(List.index(2,2))
16
```

```
10
1
4
```

5. Python min() Method

Calculates minimum of all the elements of List.
numbers = [5, 2, 8, 1, 9]
print(min(numbers))
6. Python max() Method
Calculates the maximum of all the elements of the List.
numbers = [5, 2, 8, 1, 9]
print(max(numbers))
output

```
lab4 > list-fns.py > ...
16
17  num=[5,2,8,1,9]
18  print("Minimum",min(num))
19  print("Maximum",max(num))
20
```

```
Minimum 1
Maximum 9
```

7. Python sort() Method
Sort the given data structure (both tuple and list) in ascending order.
List = [2.3,4.445,3,5.33,1.054,2.5]
List.sort()
print(List)

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List = [2.3, 4.445, 3, 5.33, 1.054, 2.5]
#Reverse flag is set True
List.sort(reverse=True)
print(List)
output

```
21  List=[2,3,4,445,3,5,33,1.054,2,5]
22  List.sort()
23  print(List)
24  List=[2.3,4.445,3,5.33,1.054,2.5]
25  List.sort(reverse=True)#descending
26  print(List)
```

```
Maximum 9
[1.054, 2, 2, 3, 3, 4, 5, 5, 33, 445]
[5.33, 4.445, 3, 2.5, 2.3, 1.054]
```

Activate Windo

8. Python reverse() Method
reverse() function reverses the order of list.
# creating a list
list = [1,2,3,4,5]
#reversing the list
list.reverse()
#printing the list
print(list)
output

```
28  list=[1,2,3,4,5]
29  list.reverse()
30  print(list)
31  #print(list.reverse())--none
32
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

TERMINAL Code

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

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Deletion of List Elements

To Delete one or more elements, i.e. remove an element, many built-in Python list functions can be used, such as pop() and remove() and keywords such as del.

1. Python pop() Method

Removes an item from a specific index in a list.

List = [2.3, 4.445, 3, 5.33, 1.054, 2.5]

print(List.pop())

output

```
List=[2.3,4.445,3,5.33,1.054,2,5]
print(List.pop())
print(List.pop(0))#index
del List[0]#index
print(List)
List.remove(3)#value
print(List)

list1=[5,2,90,24,10,2,90,34]
list2=['a','a','a','b','c','d','d','e']
list1=list(dict.fromkeys(list1))
print(list1)

list2=list(dict.fromkeys(list2))
print(list2)
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL
TERMINAL
PS G:\sem-3\python_lab> python -u "g:\sem-3\python_lab\lab4\deletion.py"
5
2.3
[3, 5.33, 1.054, 2]
[5.33, 1.054, 2]
[5, 2, 90, 24, 10, 34]
['a', 'b', 'c', 'd', 'e']
```

List = [2.3, 4.445, 3, 5.33, 1.054, 2.5]

print(List.pop(0))

output

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```python
List=[2.3,4.445,3,5.33,1.054,2,5]
print(List.pop())
print(List.pop(0))#index
del List[0]#index
print(List)
List.remove(3)#value
print(List)

list1=[5,2,90,24,10,2,90,34]
list2=['a','a','a','b','c','d','d','e']
list1=list(dict.fromkeys(list1))
print(list1)

list2=list(dict.fromkeys(list2))
print(list2)
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL
TERMINAL
PS G:\sem-3\python_lab> python -u "g:\sem-3\python_lab\lab4\deletion.py"
5
2.3
[3, 5.33, 1.054, 2]
[5.33, 1.054, 2]
[5, 2, 90, 24, 10, 34]
['a', 'b', 'c', 'd', 'e']
```

2. Python del() Method

Deletes an element from the list using it's index.

List = [2.3, 4.445, 3, 5.33, 1.054, 2.5]

del List[0]

print(List)

output

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```python
List=[2.3,4.445,3,5.33,1.054,2,5]
print(List.pop())
print(List.pop(0))#index
del List[0]#index
print(List)
List.remove(3)#value
print(List)

list1=[5,2,90,24,10,2,90,34]
list2=['a','a','a','b','c','d','d','e']
list1=list(dict.fromkeys(list1))
print(list1)

list2=list(dict.fromkeys(list2))
print(list2)
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL
TERMINAL
PS G:\sem-3\python_lab> python -u "g:\sem-3\python_lab\lab4\deletion.py"
5
2.3
[3, 5.33, 1.054, 2]
[5.33, 1.054, 2]
[5, 2, 90, 24, 10, 34]
['a', 'b', 'c', 'd', 'e']
```

3. Python remove() Method

Removes a specific element using it's value/name.

List = [2.3, 4.445, 3, 5.33, 1.054, 2.5]

List.remove(3)

print(List)

output

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```python
List=[2.3,4.445,3,5.33,1.054,2,5]
print(List.pop())
print(List.pop(0))#index
del List[0]#index
print(List)
List.remove(3)#value
print(List)

list1=[5,2,90,24,10,2,90,34]
list2=['a','a','a','b','c','d','d','e']
list1=list(dict.fromkeys(list1))
print(list1)

list2=list(dict.fromkeys(list2))
print(list2)
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL
TERMINAL
PS G:\sem-3\python_lab> python -u "g:\sem-3\python_lab\lab4\deletion.py"
5
2.3
[3, 5.33, 1.054, 2]
[5.33, 1.054, 2]
[5, 2, 90, 24, 10, 34]
['a', 'b', 'c', 'd', 'e']
```

```
# removing duplicates from a list using dictionaries
my_list_1 = [5, 2, 90, 24, 10, 2, 90, 34]
my_list_2 = ['a', 'a', 'a', 'b', 'c', 'd', 'd', 'e']

# removing duplicates from list 1
my_list_1 = list(dict.fromkeys(my_list_1))
print(my_list_1)
```

Output

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```python
List=[2.3,4.445,3,5.33,1.054,2,5]
print(List.pop())
print(List.pop(0))#index
del List[0]#index
print(List)
List.remove(3)#value
print(List)

list1=[5,2,90,24,10,2,90,34]
list2=['a','a','a','b','c','d','d','e']
list1=list(dict.fromkeys(list1))
print(list1)

list2=list(dict.fromkeys(list2))
print(list2)
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL
TERMINAL
PS G:\sem-3\python_lab> python -u "g:\sem-3\python_lab\lab4\deletion.py"
5
2.3
[3, 5.33, 1.054, 2]
[5.33, 1.054, 2]
[5, 2, 90, 24, 10, 34]
['a', 'b', 'c', 'd', 'e']
```

# removing duplicates from list 2
my_list_2 = list(dict.fromkeys(my_list_2))
print(my_list_2)
output

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```python
List=[2.3,4.445,3,5.33,1.054,2,5]
print(List.pop())
print(List.pop(0))#index
del List[0]#index
print(List)
List.remove(3)#value
print(List)

list1=[5,2,90,24,10,2,90,34]
list2=['a','a','a','b','c','d','d','e']
list1=list(dict.fromkeys(list1))
print(list1)

list2=list(dict.fromkeys(list2))
print(list2)
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL
TERMINAL
PS G:\sem-3\python_lab> python -u "g:\sem-3\python_lab\lab4\deletion.py"
5
2.3
[3, 5.33, 1.054, 2]
[5.33, 1.054, 2]
[5, 2, 90, 24, 10, 34]
['a', 'b', 'c', 'd', 'e']
```

Combining lists

We can even combine lists with the help of the zip() function which results in a list of tuples. Here each item from list A is combined with corresponding elements from list B in the form of a tuple.

```
# combing lists with the help of zip() function
my_list_1 = [5, 2, 90, 24, 10]
my_list_2 = [6, 3, 91, 25, 12]

# combined
my_combined_list = list(zip(my_list_1, my_list_2))
print(my_combined_list)
```

output

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```
1   list1=[5,2,90,24,10]
2   list2=[6,3,91,25,12]
3   comb=list(zip(list1,list2))
4   print(comb)

PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL
TERMINAL                                  Code
PS G:\sem-3\python_lab> python -u "g:\sem-3\python_lab\lab4\combining
[(5, 6), (2, 3), (90, 91), (24, 25), (10, 12)]
```

Finding the most common item

To find the most frequent element we make use of the set() function. The set() function removes all the duplicates from the list, and the max() function returns the most frequent element (which is found with the help of 'key'). The key is an optional single argument function.

```
# to find the most frequent element from the list
my_list = ['a', 'a', 'a', 'b', 'c', 'd', 'd', 'e']
most_frequent_value = max(set(my_list), key=my_list.count)
print("The most common element is:", most_frequent_value)
```

output

```
lab4 > mostFrequent.py > ...
1   list1=['a','a','a','b','c','d','d','e']
2   fre_vl=max(set(list1),key=list1.count)
3   print("Most frequent element:",fre_vl)
4

PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL
TERMINAL                                  Code
PS G:\sem-3\python_lab> python -u "g:\sem-3\python_lab\lab4\mostFrequent.py"

Most frequent element: a
```

Flatten a list of lists

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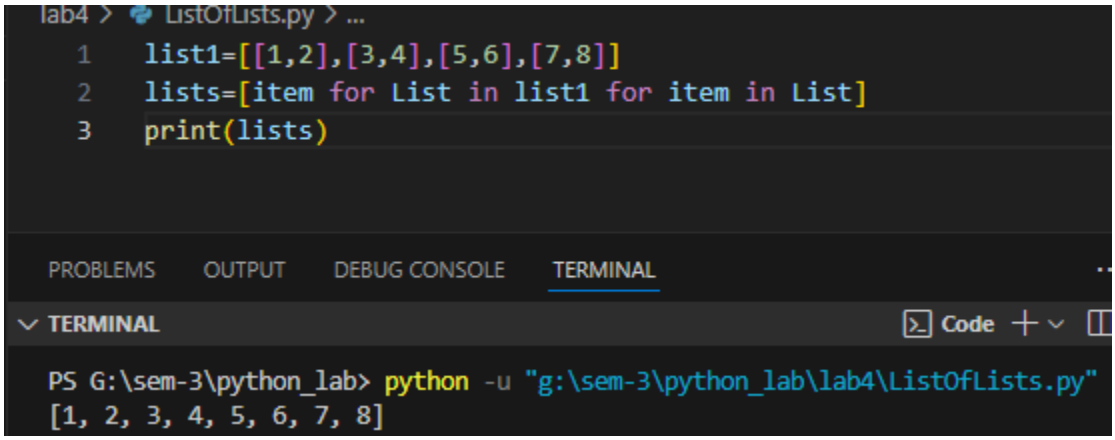
Sometimes we encounter a list where each element in itself is a list. To convert a list of lists into a single list, we use list comprehension.

```
# to flatten a list_of_lists by using list comprehension
list_of_lists = [[1, 2],
                 [3, 4],
                 [5, 6],
                 [7, 8]]
# using list comprehension
my_list = [item for List in list_of_lists for item in List]
print(my_list)
```

output



Post Lab Exercise:

a. Write a Python program to multiply all the items in a list.
b. Write a Python program to get the largest number from a list.
c. Write a Python program to remove duplicates from a list.
d. Write a Python program to get the frequency of elements in a list.
e. Find common items from two lists
f. Convert a list of multiple integers into a single integer

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lab4 > PostLab.py > ...

```python
#a. Multiply all the items in a list
import math
list1=[2,3,4]
print("Product of elements:",math.prod(list1))

res=1
for num in list1:
    res*=num
print("Product of elements:",res)

```

```
PS G:\sem-3\python_lab> python -u "g:\sem-3\python_lab\lab4\PostLab.py"
Product of elements: 24
Product of elements: 24
```

lab4 > PostLab.py > ...

```python
#b. Get the largest number from a list
list2=[3,90,123,1,-3]
print("Largest number:",max(list2))

```

```
Largest number: 123
```

```python
#c. Remove duplicates from a list
list3=['a','a','a','b','c','d','d','e']
list3=list(dict.fromkeys(list3))
print(list3)
```

```
['a', 'b', 'c', 'd', 'e']
```

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```
#d.Get the frequency of elements in a list
list4 = ['a','a','a','b','c','d','d','e']
freq={}
for i in list4:
    freq[i]=freq[i]+1 if i in freq else 1
print("Frequency of elements:",freq)
```

```
Frequency of elements: {'a': 3, 'b': 1, 'c': 1, 'd': 2, 'e': 1}
```

```
#e.find common items from two lists
list51=[1,2,3,4,5]
list52=[4,5,6,7,8]
print(list(set(list51)&set(list52)))
```

```
[4, 5]
```

```
#f.Convert a list of multiple integers into a single integer
list6=[3,4,5,6,7]
print(int("".join(map(str,list6))))
```

```
34567
```

GITHUB LINK

https://github.com/Heer972005/Python_Lab