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<b>Subject: Programming With Python (01CT1309)</b>	<b>Aim:</b> Write a python program to create, append and remove lists in python.	
<b>Experiment No: 04</b>	<b>Date:</b>	<b>Enrollment No:92400133189</b>

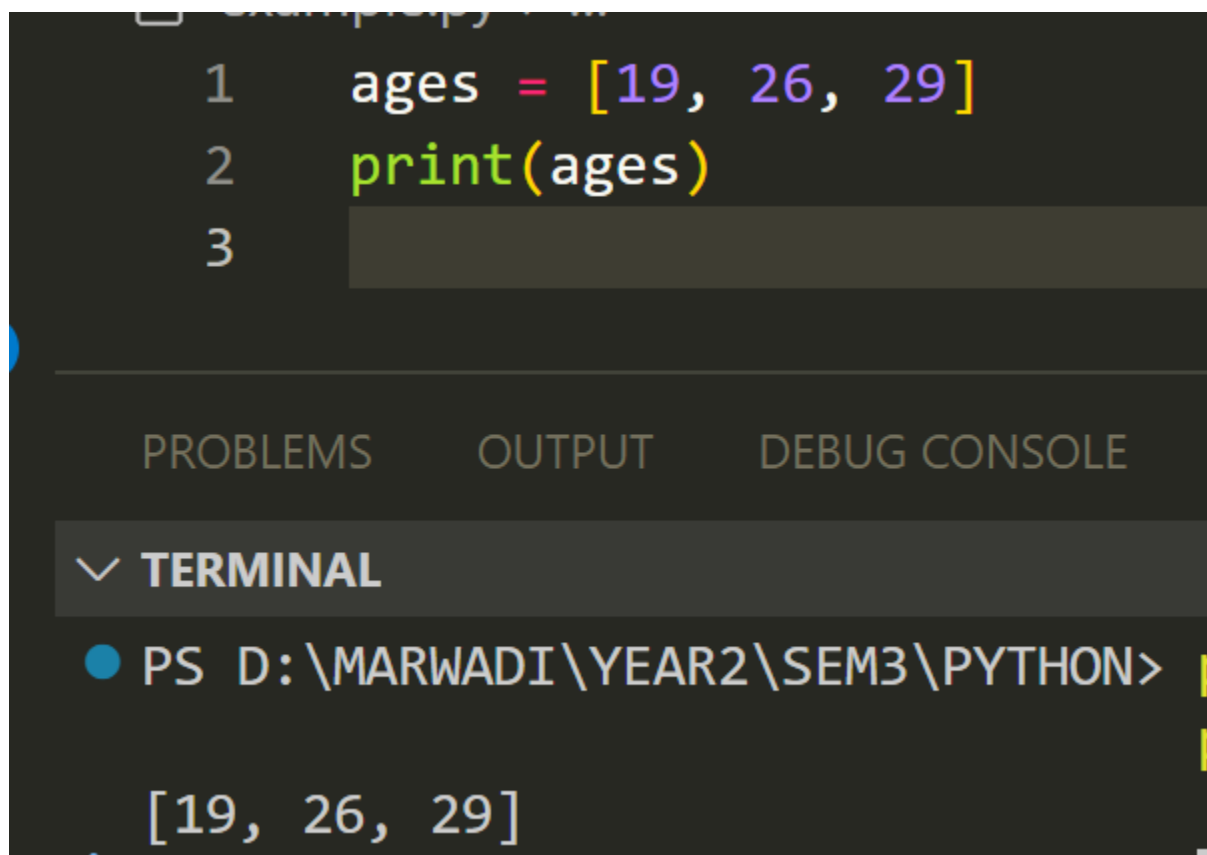
**Aim:** Write a python program to create, append and remove lists in python.

**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:
```



```

1  ages = [19, 26, 29]
2  print(ages)
3



```

PROBLEMS    OUTPUT    DEBUG CONSOLE

✓ **TERMINAL**

● PS D:\MARWADI\YEAR2\SEM3\PYTHON>

[19, 26, 29]

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Task:

```
a = list(range(5))
print(a)
```

Output:

```

1  a= list(range (5))
2  print(a)


```

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● PS D:\MARWADI\YEAR2\SEM3\PYTHON>

[0, 1, 2, 3, 4]

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

```

1  a= list(range (5,10))
2  print(a)

```

---

PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL

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```

PS D:\MARWADI\YEAR2\SEM3\PYTHON> python

python

[5, 6, 7, 8, 9]
PS D:\MARWADI\YEAR2\SEM3\PYTHON>

```

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

```

1  a= list(range (0,10,2))
2  print(a)

```



---

PROBLEMS      OUTPUT      DEBUG CONSOLE

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PS D:\MARWADI\YEAR2\SEM3\PYTHON>

● [0, 2, 4, 6, 8]

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

**Subject: Programming With Python (01CT1309)**

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

**Experiment No: 04**

**Date:**

**Enrollment No:92400133189**

```
1  a= list(range (10,0,-2))
2  print(a)
```

PROBLEMS

OUTPUT



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python

```
● [10, 8, 6, 4, 2]
```

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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:

```

1  List = ['Mathematics', 'chemistry', 1997, 2000]
2  List.append(20544)
3  print(List)
4

```

PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL

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```

● PS D:\MARWADI\YEAR2\SEM3\PYTHON> python -u "d:\MARWADI\YEAR2\SE
['Mathematics', 'chemistry', 1997, 2000, 20544]

```

### 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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```

1  List = ['Mathematics', 'chemistry', 1997, 2000]
2  List.insert(2, 10087)
3  print(List)
4

```

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```

● PS D:\MARWADI\YEAR2\SEM3\PYTHON> python -u "d:\MARWADI\YEAR2\SEM3\PYTHON\1.py"
['Mathematics', 'chemistry', 10087, 1997, 2000]

```

### 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:

```

```

1  List1 = ['Mathematics', 'chemistry', 1997, 2000]
2  List2 = [1, 2, 3, 4, 5, 6, 7]
3  List1.extend(List2)
4  print(List1)

```

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```

● PS D:\MARWADI\YEAR2\SEM3\PYTHON> python -u "d:\MARWADI\YEAR2\SEM3\PYTHON\2.py"
['Mathematics', 'chemistry', 1997, 2000, 1, 2, 3, 4, 5, 6, 7]

```





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Task:

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

print(sum(List))

output

```

2 List2 = [1, 2, 3, 4, 5, 6, 7]
3 print(sum(List1))
4

```

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```

python -u "d:\MARWADI\YEAR2\SEM3\PYTHON\example.py"
Traceback (most recent call last):
  File "d:\MARWADI\YEAR2\SEM3\PYTHON\example.py", line 3, in <module>
    print(sum(List1))
           ~~~^~~~~~
TypeError: unsupported operand type(s) for +: 'int' and 'str'

```

## 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'))

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<b>Experiment No: 04</b>	<b>Date:</b>	<b>Enrollment No:92400133189</b>

output:

```

1 List1 = ['Mathematics', 'chemistry','Mathematics', 1997,'Mathematics', 2000]
2 List2 = [1, 2, 3, 4, 5, 6, 7]
3 print(List1.count('Mathematics'))
4 print(List2.count(1))

```

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```

PS D:\MARWADI\YEAR2\SEM3\PYTHON> python -u "d:\MARWADI\YEAR2\SEM3\PYTHON\example.py"
3
1

```



### 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))
```

output

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<b>Experiment No: 04</b>	<b>Date:</b>	<b>Enrollment No:92400133189</b>

```

2   List2 = [1, 2, 3, 4, 5, 6, 7]
3   print(len(List2))
4


```

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pytho

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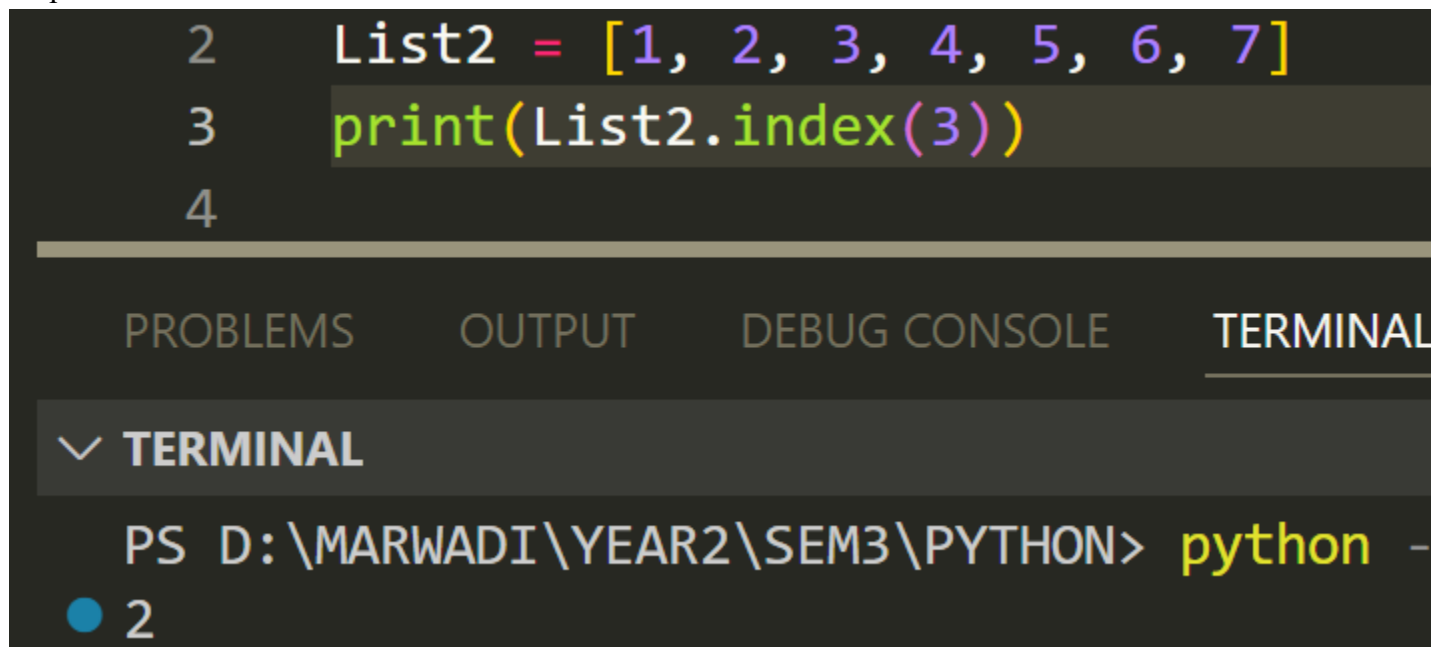
#### 4. Python index() Method

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))
```

output



```

2 List2 = [1, 2, 3, 4, 5, 6, 7]
3 print(List2.index(3))
4

```

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```

PS D:\MARWADI\YEAR2\SEM3\PYTHON> python -
● 2


```

Task:

```
List = [1, 2, 3, 1, 2, 1, 2, 3, 2, 1]
```

```
print(List.index(2, 2))
```

output

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```

1  List1 = [1, 2, 3, 4, 5, 6, 7]
2  List2 = [1, 2, 3, 4, 5, 6, 7]
3  print(List2.index(3,3))
4

```

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```

⊗ PS D:\MARWADI\YEAR2\SEM3\PYTHON> python -u "d:\MARWADI\YEAR2\SEM3\PYTHON\example.py"
Traceback (most recent call last):
  File "d:\MARWADI\YEAR2\SEM3\PYTHON\example.py", line 3, in <module>
    print(List2.index(3,3))
                        ~~~~~^
ValueError: 3 is not in list

```



## 5. Python min() Method

Calculates minimum of all the elements of List.

```
numbers = [5, 2, 8, 1, 9]
```

```
print(min(numbers))
```

output

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<b>Experiment No: 04</b>	<b>Date:</b>	<b>Enrollment No:92400133189</b>

```

2 List2 = [1, 2, 3, 4, 5, 6, 7]
3 print(min(List2))
4

```

PROBLEMS


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```
python -u "d:\MARWADI
```

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<b>Experiment No: 04</b>	<b>Date:</b>	<b>Enrollment No:92400133189</b>

#### 6. Python max() Method

Calculates the maximum of all the elements of the List.

```
numbers = [5, 2, 8, 1, 9]
```

```
print(max(numbers))
```

output

```

2  List2 = [1, 2, 3, 4, 5, 6, 7]
3  print(max(List2))
4

```

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```

python -u "d:\M

```

7



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### 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)

output

```

2  List2 = [1,7,6,8, 2, 3, 4, 5, 6, 7]
3  List2.sort()
4  print(List2)
5  
```

PROBLEMS

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```
python -u "d:\MARWADI\
[1, 2, 3, 4, 5, 6, 6, 7, 7, 8]
```

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<b>Subject: Programming With Python (01CT1309)</b>	<b>Aim:</b> Write a python program to create, append and remove lists in python.	
<b>Experiment No: 04</b>	<b>Date:</b>	<b>Enrollment No:92400133189</b>

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

```

3  List = [2.3, 4.445, 3, 5.33, 1.054, 2.5]
4  List.sort(reverse=True)
5  print(List)



```

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```
python -u "d:\MARWADI\
[5.33, 4.445, 3, 2.5, 2.3, 1.054]
```

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<b>Subject: Programming With Python (01CT1309)</b>	<b>Aim:</b> Write a python program to create, append and remove lists in python.	
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#### 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)
```

#### 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

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example.py > ...

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

2 print(List.pop())

3



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2.5

python -u "d:\MARWADI\YEAR0\SEM0\PYTHON\...

 <b>Marwadi University</b> Marwadi Chandarana Group 	<b>Marwadi University</b> <b>Faculty of Engineering &amp; Technology</b> <b>Department of Information and Communication Technology</b>	
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<b>Experiment No: 04</b>	<b>Date:</b>	<b>Enrollment No:92400133189</b>

List = [2.3, 4.445, 3, 5.33, 1.054, 2.5]  
print(List.pop(0))  
output

```
1 List = [2.3, 4.445, 3, 5.33, 1.054, 2.5]
2 print(List.pop(0))
3
```

PROBLEMS

OUTPUT


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python -u "d:\MARWADI\YEAR2\SEM2\PYTHON

2.3

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<b>Subject: Programming With Python (01CT1309)</b>	<b>Aim:</b> Write a python program to create, append and remove lists in python.	
<b>Experiment No: 04</b>	<b>Date:</b>	<b>Enrollment No:92400133189</b>

## 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

```

1 List = [2.3, 4.445, 3, 5.33, 1.054, 2.5]
2 del List[0]
3 print(List)
4

```

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```

python -u "d:\MARWADI\YEAR2\SEM
[4.445, 3, 5.33, 1.054, 2.5]

```

## 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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<b>Subject: Programming With Python (01CT1309)</b>	<b>Aim:</b> Write a python program to create, append and remove lists in python.	
<b>Experiment No: 04</b>	<b>Date:</b>	<b>Enrollment No:92400133189</b>

```

1 List = [2.3,3, 4.445, 4,3, 5.33, 1.054, 2.5]
2 List.remove(3)
3 print(List)
4

```

PROBLEMS

OUTPUT

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```

python -u "d:\MARWADI\YEAR2\SEM3\F
[2.3, 4.445, 4, 3, 5.33, 1.054, 2.5]

```

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# 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

# removing duplicates from list 2

```
my_list_2 = list(dict.fromkeys(my_list_2))
```

```
print(my_list_2)
```

output

```

1  my_list_1 = [5, 2, 90, 24, 10, 2, 90, 34]
2  my_list_2 = ['a', 'a', 'a', 'b', 'c', 'd', 'd', 'e']
3
4  my_list_1 = list(dict.fromkeys(my_list_1))
5  print(my_list_1)
6
7  my_list_2 = list(dict.fromkeys(my_list_2))
8  print(my_list_2)
9

```

PROBLEMS

OUTPUT

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PS D:\MARWADI\YEAR2\SEM3\PYTHON\PythonPostLab> python -u "d:

[5, 2, 90, 24, 10, 34]

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



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<b>Subject: Programming With Python (01CT1309)</b>	<b>Aim:</b> Write a python program to create, append and remove lists in python.	
<b>Experiment No: 04</b>	<b>Date:</b>	<b>Enrollment No:92400133189</b>

### 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.

# combining 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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<b>Subject: Programming With Python (01CT1309)</b>	<b>Aim:</b> Write a python program to create, append and remove lists in python.	
<b>Experiment No: 04</b>	<b>Date:</b>	<b>Enrollment No:92400133189</b>

```

1  my_list_1 = [5, 2, 90, 24, 10]
2  my_list_2 = [6, 3, 91, 25, 12]
3
4  # combined
5  my_combined_list = list(zip(my_list_1, my_list_2))
6  print(my_combined_list)
7

```



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```

PS D:\MARWADI\YEAR2\SEM3\PYTHON\PythonPostLab> python -u "d:\MARWADI\
python -u "d:\MARWADI\
[(5, 6), (2, 3), (90, 91), (24, 25), (10, 12)]
PS D:\MARWADI\YEAR2\SEM3\PYTHON\PythonPostLab>

```

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<b>Subject: Programming With Python (01CT1309)</b>	<b>Aim:</b> Write a python program to create, append and remove lists in python.	
<b>Experiment No: 04</b>	<b>Date:</b>	<b>Enrollment No:92400133189</b>



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

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```

1  my_list = ['a', 'a', 'a', 'b', 'c', 'd', 'd', 'e']
2  most_frequent_value = max(set(my_list), key=my_list.count)
3  print("The most common element is:", most_frequent_value)
4

```

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python -u "d:\MARWADI\YEAR2\SEM3\PYTH

● The most common element is: a

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Flatten a list of lists

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
```

**Subject: Programming With Python (01CT1309)**

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

**Experiment No: 04**

**Date:**

**Enrollment No:92400133189**

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

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PS D:\MARWADI\YEAR2\SEM3\PYTHON\PythonPostLab> py



python -u "d:\MARWADI\YEAR2\SEM3\P

• [1, 2, 3, 4, 5, 6, 7, 8]

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**Post Lab Exercise:**

- a. Write a Python program to multiply all the items in a list.

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<b>Experiment No: 04</b>	<b>Date:</b>	<b>Enrollment No:92400133189</b>

```

4 > 4-1.py > ...
1  nums = [2, 3, 4, 5]
2  result = 1
3  for n in nums:
4      result *= n
5  print(result)
6

```

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python -u "d:\MARWADI\YEAR2\SE

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- b. Write a Python program to get the largest number from a list.

```

4 > 4-2.py > ...
1  nums = [10, 45, 67, 23, 89, 12]
2  print(max(nums))
3

```

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- c. Write a Python program to remove duplicates from a list.

```


4 > 4-3 > ...
1  nums = [1, 2, 2, 3, 4, 4, 5]
2  nums = list(dict.fromkeys(nums))
3  print(nums)
4

```

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PS D:\MARWADI\YEAR2\SEM3\PYTHON\PythonPostLab> python -u  
[1, 2, 3, 4, 5]

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d. Write a Python program to get the frequency of elements in a list.

```

4 > 4-4.py > ...
1  nums = [1, 2, 2, 3, 4, 4, 5, 1]
2  freq = {}
3  for n in nums:
4      freq[n] = freq.get(n, 0) + 1
5  print(freq)
6

```



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```

PS D:\MARWADI\YEAR2\SEM3\PYTHON\PythonPostLab> python -u "d
python -u "d
{1: 2, 2: 2, 3: 1, 4: 2, 5: 1}

```

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e. Find common items from two lists

```

4 > 4-5.py > ...
1  list1 = [1, 2, 3, 4]
2  list2 = [3, 4, 5, 6]
3  common = list(set(list1) & set(list2))
4  print(common)
5

```


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```

PS D:\MARWADI\YEAR2\SEM3\PYTHON\PythonPostLab> python -u
python -u
{1: 2, 2: 2, 3: 1, 4: 2, 5: 1}

```

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<b>Subject: Programming With Python (01CT1309)</b>	<b>Aim:</b> Write a python program to create, append and remove lists in python.	
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f. Convert a list of multiple integers into a single integer

```

4 > 4-6.py > ...
1  nums = [1, 2, 3, 4]
2  single_int = int("".join(map(str, nums)))
3  print(single_int)
4

```

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```

PS D:\MARWADI\YEAR2\SEM3\PYTHON\PythonPostLab> python -u "d:\MA
● 1234

```

Github : [PythonPostLab/4 at main · Om-Lathigara/PythonPostLab](https://github.com/Om-Lathigara/PythonPostLab)