Practical-4: Lists and Tuples

1) Explain difference between insert, append and extend operations on list. Write a program to create and initialize list with your name, enrollment number, age, branch and result. Perform insert, remove, update, append and extend operation on list.

Answer & Code:

```
intro=["AMIT GOSWAMI",21012021003,20,"CEIT-B",9.25]
intro.insert(2,'U.V.P.C.E')
print("After using insert : ",intro)
intro.remove('CEIT-B')
print("After using remove : ",intro)
intro.append('GUNI')
print("After using append : ",intro)
intro.extend("P-PY")
print("After using expend : ",intro)
intro[2]='NILESH SIR'
print("After using update :",intro)
```

Output:

```
After using insert :  ['AMIT GOSWAMI', 21012021003, 'U.V.P.C.E', 20, 'CEIT-B', 9.25]
After using remove :  ['AMIT GOSWAMI', 21012021003, 'U.V.P.C.E', 20, 9.25]
After using append :  ['AMIT GOSWAMI', 21012021003, 'U.V.P.C.E', 20, 9.25, 'GUNI']
After using expend :  ['AMIT GOSWAMI', 21012021003, 'U.V.P.C.E', 20, 9.25, 'GUNI', 'P', '-', 'P', 'Y']
After using update : ['AMIT GOSWAMI', 21012021003, 'NILESH SIR', 20, 9.25, 'GUNI', 'P', '-', 'P', 'Y']
```

2) Write a program to search an element, find maximum & minimum value from the list.
Using inbuilt function 2) Using for loop.

Code:

```
print("21012021003_AMIT GOSWAMI")
li=[4,4,6,7,4,9,2,3,6,9,10,11,16]
print(li)
i=int(input("Enter the number to search : "))
j=li.index(i)
print("the element you want to find is at index : ",j)
n=max(li)
print("Maximun value is : ",n)
m=min(li)
print("Mininum value is : ",m)
```

Output:

```
21012021003_AMIT GOSWAMI
[4, 4, 6, 7, 4, 9, 2, 3, 6, 9, 10, 11, 16]
Enter the number to search : 9
the element you want to find is at index :  5
Maximun value is :  16
Mininum value is :  2
```

2. Code:

```
print("21012121003_AMIT GOSWAMI")
li=[4,4,6,7,4,9,2,3,6,9,10,11,16]
```

```
print(li)
n=int(input("Enter the number to search : "))
max=min=li[0]
temp=0
for i in li:
   if(n==i):
      temp=0

if(i>max):
   max=i
elif(i<min):
   min=i
if(temp==0):
   print("element is present in list.")
else:
   print("element is not present in list.")
print("The max element is : ",max)
print("The min element is : ",min)
```

Output:

```
21012121003_AMIT GOSWAMI
[4, 4, 6, 7, 4, 9, 2, 3, 6, 9, 10, 11, 16]
Enter the number to search : 6
element is present in list.
The max element is :  16
The min element is :  4
```

3) Create a program that asks the user for a number and then prints out a list of all the divisors of that number.

Code:

```
print("21012121003_AMIT GOSWAMI")
n=int(input("Enter a number : "))
li=[]
for i in range(1,(n+1)):
   if(n%i==0):
      li.append(i)
print(li)
```

Output:

```
21012121003_AMIT GOSWAMI
Enter a number : 45
[1, 3, 5, 9, 15, 45]
```

4) WAP to sort element in list
1. In same list

Code:

```
print("21012121003_AMIT GOSWAMI")
li=[1,2,4,6,7,5,7,4]
li.sort()
print(f"After sorting list is : {li}")
```

Output:

```
21012121003_AMIT GOSWAMI
After sorting list is : [1, 2, 4, 4, 5, 6, 7, 7]
```

2. Create sorted copy of original list & print both.

Code:

```
print("21012121003_AMIT GOSWAMI")
li=[2,4,6,9,5,4,7,8,5,5]
print("List before sorting : {}".format(li))
l2=sorted(li)
print("List after sorting:{}".format(l2))
```

Output:

```
21012121003_AMIT GOSWAMI
List before sorting : [2, 4, 6, 9, 5, 4, 7, 8, 5, 5]
List after sorting:[2, 4, 4, 5, 5, 5, 6, 7, 8, 9]
```

3. Sort without any built-in function

Code:

```
print("21012121003_AMIT GOSWAMI")
li=[2,5,6,7,8,9,4,3,2,1]
for i in range(0,len(li)):
   for j in range(i+1,len(li)):
      if(li[i]>li[j]):
         temp=li[i]
li[i]=li[j]
li[j]=temp
print("list after sorting :{}".format(li))
```

Output:

```
21012121003_AMIT GOSWAMI
list after sorting :[1, 2, 2, 3, 4, 5, 6, 7, 8, 9]
```

5) Take two lists, say for example these two:
a = [1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89]
b = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13]
and write a program that returns a list that contains only the elements that are common between the lists (without duplicates). Make sure your program works on two lists of different sizes.

Code:

```
print("21012121003_AMIT GOSWAMI")
a=[1,1,2,3,5,8,13,21,34,55,89]
b=[1,2,3,4,5,6,7,8,9,10,11,12,13]
print(a)
print(b)
c=[]
for i in a:
   if i in b and i not in c :
      c.append(i)
print("common in both is: {}".format(c))
```

Output:

```
21012121003_AMIT GOSWAMI
[1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89]
[1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13]
common in both is: [1, 2, 3, 5, 8, 13]
```

6) Write a Python program which takes a list and returns a list with the elements "Shifted left by one position" so [1, 2, 3] yields [2, 3, 1]. Example: [11, 12, 13] → [12, 13, 11].

Code:

```
l1 = [1,2,3]
l2=[]
for i,j in enumerate(l1) :
   l2.insert(i-j,j)
print("original list {}".format(l1))
print("after shifting element list : {}".format(l2))
```

Output:

```
21012121003_AMIT GOSWAMI
original list [1, 2, 3]
after shifting element list : [2, 3, 1]
```

7) Write a program which takes a comma separated string from user & store each string which separated by comma in list & display list.

Code:

```
print("21012121003_AMIT GOSWAMI")
str=input("enter a string : ")
print(str.split(sep=","))
```

Output:

```
21012121003_AMIT GOSWAMI
enter a string : Amit,vishal,Brijesh,Vikas
['Amit', 'vishal', 'Brijesh', 'Vikas']
```

8) Write a program to create and initialize the tuple. Also remove 3rd element from tuple.

Code:

```
print("21012121003_AMIT GOSWAMI")
l1=("AMIT","GOSWAMI","UVPCE","IT","4th sem")
print(f"original tuple is : {l1}")
l1=l1[:2]+l1[3:]
print(f"after removing 3rd element from tuple : {l1}")
```

Output:

```
21012121003_AMIT GOSWAMI
original tuple is : ('AMIT', 'GOSWAMI', 'UVPCE', 'IT', '4th sem')
after removing 3rd element from tuple : ('AMIT', 'GOSWAMI', 'IT', '4th sem')
```

9) Create a tuple with name courses and initialize it with JAVA, PHP, C#, Android. Insert two items HTML and Python at the 3rd position in tuple.

Code:

```
print("21012121003_AMIT GOSWAMI")
l1=["JAVA","PHP","C#","ANDROID"]
l2=["HTML","PYTHON"]
a=list(l1)
a.insert(2,l2)
l3=tuple(a)
print(f"original tuple : {l1}")
print(f"after inserting tuple at 3rd position is : {l3}")
```

Output:

```
21012121003_AMIT GOSWAMI
original tuple : ['JAVA', 'PHP', 'C#', 'ANDROID']
after inserting tuple at 3rd position is : ('JAVA', 'PHP', ['HTML', 'PYTHON'], 'C#', 'ANDROID')
```