TYPE-C: CH-11: LIST MANIPULATION

1) Write a program to increment the elements of a list with a number.

sol:

```
lst=eval(input('enter the list:'))
n=int(input('enter the number to increament:'))
for i in range(len(lst)):
    lst[i]+=n
print('the updated list is: ',lst)
```

output:

```
enter the list:[1,2,3,4,5,6]
enter the number to increament:10
the updated list is:  [11, 12, 13, 14, 15, 16]
```

2) Write a program that reverses a list of integers (in place).

sol:

```
lst=eval(input('enter the list:'))
print('original list is:',lst)
lst.reverse()
print('the reversed list is:',lst)
```

output:

```
enter the list:[1,2,3,4,5]
original list is: [1, 2, 3, 4, 5]
the reversed list is: [5, 4, 3, 2, 1]
```

3) Write a program that inputs two lists and creates a third, that contains all elements of the first followed by all elements of the second.

sol:

```
lst=eval(input('enter the list:'))
lst2=eval(input('enter the list2:'))
list3=lst+lst2
print('the joined list is:',list3)
```

output:

```
enter the list:[1,2,3,4,5]
enter the list2:[6,7,8,9,10]
the joined list is: [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
```

4) Ask the user to enter a list containing numbers between 1 and 12. Then replace all of the entries in the list that are greater than 10 with 10.

sol:

```
lst=eval(input('enter the list:'))
lst2=[]
for i in  lst:
    if i>10:
        lst2.append(10)
    else:
        lst2.append(i)
lst=lst2
print('the updated list is: ',lst)
```

output:
enter the list:[1,7,8,13,5,14,10]
the updated list is: [1, 7, 8, 10, 5, 10, 10]

5) Ask the user to enter a list of strings. Create a new list that consists of those strings with their first characters removed.

sol:

```
lst=eval(input('enter the list:'))
lst2=[]
for i in lst:
    a=i.partition(i[0])
    lst2.append(a[2])
print(lst2)
```

output:
enter the list:['hi','python','world']
['i', 'ython', 'orld']

6) Write a program to check if a number is present in the list or not. If the number is present, print the position of the number. Print an appropriate message if the number is not present in the list.

sol:

```
lst=eval(input('enter the list: '))
n=int(input('enter the number: '))
if n in lst:
    a=lst.index(n)
    print('in position',a,n,'is present')
else:
    print(n,'does not exist in the given list')
```

output:
enter the list: [1,2,3,4,5,6,7,8,9,0]
enter the number: 5
in position 4 5 is present

7)
a) Create the following lists using a for loop: A list consisting of the integers 0 through 49.
sol:

```
lst=[]
for i in range(0,50):
    lst.append(i)
print(lst)
```

output:
[0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49]

b) Create the following lists using a for loop: A list containing the squares of the integers 1 through 50.

sol:

```
lst=[]
for i in range(1,51):
    lst.append(i**2)
print(lst)
```

output:
[1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225, 256, 289, 324, 361, 400, 441, 484, 529, 576, 625, 676, 729, 784, 841, 900, 961, 1024, 1089, 1156, 1225, 1296, 1369, 1444, 1521, 1600, 1681, 1764, 1849, 1936, 2025, 2116, 2209, 2304, 2401, 2500]

c) Create the following lists using a for loop: The list ['a','bb','ccc','dddd', . . .] that ends with 26 copies of the letter z.

sol:

```
lst=[]
for i in range(1,27):
    lst.append(chr(96+i)*i)
print(lst)
```

output:
['a', 'bb', 'ccc', 'dddd', 'eeeee', 'ffffff', 'ggggggg', 'hhhhhhhh', 'iiiiiiiii', 'jjjjjjjjj', 'kkkkkkkkkk', 'lllllllllll', 'mmmmmmmmmmmm', 'nnnnnnnnnnnnn', 'ooooooooooooooo', 'pppppppppppppppp', 'qqqqqqqqqqqqqqqqq', 'rrrrrrrrrrrrrrrrr', 'sssssssssssssssss', 'tttttttttttttttttt', 'uuuuuuuuuuuuuuuuuuu', 'vvvvvvvvvvvvvvvvvvvvv', 'wwwwwwwwwwwwwwwwwwwww', 'xxxxxxxxxxxxxxxxxxxxxx', 'yyyyyyyyyyyyyyyyyyyyyyy', 'zzzzzzzzzzzzzzzzzzzzzzzz']

8) Write a program that takes any two lists L and M of the same size and adds their elements together to form a new list N whose elements are sums of the corresponding elements in L and M. For instance, if L = [3, 1, 4] and M = [1, 5, 9], then N should equal [4,6,13].

sol:

```
l=eval(input('enter the list:'))
m=eval(input('enter the lsit 2:'))
n=[]
if len(m)==len(l):
    a=len(m)
    for i in range(a):
        sum=m[i]+l[i]
        n.append(sum)
    print('the new list is:',n)
else:
    perint('enter the lis with equal length')
```

output:

```
enter the list:[1,22,3,4,5]
enter the lsit 2:[7,8,6,5,4]
the new list is: [8, 30, 9, 9, 9]
```

9) Write a program rotates the elements of a list so that the element at the first index moves to the second index, the element in the second index moves to the third index, etc., and the element in the last index moves to the first index.

sol:

```
l = eval(input("Enter the list: "))
print("Original List")
print(l)
l = l[-1:] + l[:-1]
print("Rotated List")
print(l)
```

output:
```
Enter the list: [8, 10, 13, 25, 7, 11]
Original List
[8, 10, 13, 25, 7, 11]
Rotated List
[11, 8, 10, 13, 25, 7]
```

10) Write a program that reads the n to display nth term of Fibonacci series.

The Fibonacci sequence works as follows:

element 0 has the value 0
element 1 has the value 1
every element after that has the value of the sum of the two preceding elements
The beginning of the sequence looks like:
0, 1, 1, 2, 3, 5, 8, 13, 21, 34, ...

The program prompts for element and prints out the value of that element of the Fibonacci sequence.

Thus:

input 7, produces 13
input 9, produces 34
Hints:
A Don't try to just type out the entire list. It gets big very fast. Element 25 is 75205. Element 100 is 354224848179261915075. So keep upper limit of n to 20.

sol:
```
n=int(input('enter the number:'))
if n>20:
    print("n need to be less than 20")
else:
    a=0
    b=1
    c=a+b
    for i in range(3,n+1):
        a=b
        b=c
        c=a+b
    print(n, "term of Fibonacci series =", c)
```

output:
```
enter the number:14
14 term of Fibonacci series = 377
```

11)
a)Write programs as per following specifications:

```
'''Print the length of the longest
string in the list of strings str_list.
Precondition : the list will contain
at least one element.'''
```

sol:
```
str_list=eval(input('enter the list:'))
b=0
for i in str_list:
```

```
        a=len(i)
        if a>b:
            b=a
            big=i
    print(big,'is the biggest word')
```

output:

```
  enter the list:['life','is','very','precious']
  precious is the biggest word
```

b) Write programs as per following specifications:

'''L is a list of numbers. Print a new list where each element is the corresponding element of list L summed with number num.'''

sol:

```
  num=int(input('enter the num:'))
  list=eval(input('enter the list:'))
  new=[]
  for i in list:
      new.append(i+num)
  print('the new list is:',new)
```

output:

```
  enter the num:100
  enter the list:[10,20,30,40]
  the new list is: [110, 120, 130, 140]
```

12) Write a program to read two lists num and denum which contain the numerators and denominators of same fractions at the respective indexes. Then display the smallest fraction along with its index.

sol:

```
  num=eval(input('enter the list of numerators:'))
  denum=eval(input('enter the list of denominators:'))
  list=[]
  a=len(num)
  for i in range(a):
      b=num[i]/denum[i]
      list.append(b)
  small=min(list)
  ra=list.index(small)
  print('the smallest fraction is:',num[ra],'/',denum[ra])
```

output:

```
  enter the list of numerators:[3,67,432,5]
  enter the list of denominators:[3,9,5,32]
  the smallest fraction is: 5 / 32
```

13) Write a program to display the maximum and minimum values from the specified range of indexes of list.

sol:

```
  l=eval(input('enter the list:'))
  start=int(input("enter the start value:"))
  stop=int(input("enter the stop value:"))
  new=l[start:stop+1]
  maxi=max(new)
```

```
mini=min(new)
print('the maximum value is:',maxi)
print('the minimum value is:',mini)
```

output:

```
enter the list:[1,2,3,4,5,6,7,8,9,10,11,12,1,15]
enter the start value:5
enter the stop value:10
the maximum value is: 11
the minimum value is: 6
```

14) Write a program to move all duplicate values in a list to the end of the list.

sol:

```
list=eval(input('enter the list:'))
org=[]
dup=[]
for i in list:
    if i in org:
        dup.append(i)
    else:
        org.append(i)
list=org+dup
print('the modified list is: ',list)
```

output:

```
enter the list:[1,2,2,3,3,4,5,6,5]
the modified list is:  [1, 2, 3, 4, 5, 6, 2, 3, 5]
```

15) Write a program to compare two equal sized lists and print the first index where they differ.

sol:

```
list1=eval(input('enter the list1: '))
list2=eval(input('enter the list2: '))
a=len(list1)
if len(list1)!=len(list2):
    print('enter lists with equal lenghth')
else:
    for i in range(a):
        if list1[i]!=list2[i]:
            print('list differ at index',i)
            break
if list1==list2:
    print('both lists are same')
```

output:

```
enter the list1: [1,2,3]
enter the list2: [1,4,3]
list differ at index 1
--------------------------------
enter the list1: [1,2,3,4]
enter the list2: [1,2,3,4]
both lists are same
--------------------------------
enter the list1: [1,2,3,4,5]
enter the list2: [1,2,3]
enter lists with equal lenghth
```