PROGRAMMING LAB

LAB CYCLE 1.1

1.Display future leap years from current year to a final year entered by user.

PROGRAM:

```
x=int(input("enter the current year: "))
y=int(input("enter the final year: "))
print("leap years:")
while(x<=y):
  if((x%4==0)and((x%100!=0)or(x%400==0))):
    print(x)
    x=x+1
  else:
    x=x+1
```

OUTPUT:

```
enter the current year: 2021
enter the final year: 2042
leap years:
2024
2028
2032
2036
2040
```

2. Generate positive list of numbers from a given list of integers

PROGRAM:

```
list1=[1,-5,60,-21,34,44,-9]                    #declaring a list of numbers
print("positive list of numbers from list1:")   #printing  statement
for i in list1:                                 #iterating each number in list1
  if(i>0):                                      #checking  condition
    print(i,end=" ")
```

OUTPUT:

```
positive list of numbers from list1:
1 60 34 44
```

3. Generate the Square of N numbers for the given list.

PROGRAM:

```
list=[12,5,20,4,1]
print("list elements: ")
print(list)
list1=[]
print("square list: ")
for i in list:                          #iterating each element in list
  i=i*i
  list1.append(i)                       #append() stores  each element to the list1
print(list1)
```

OUTPUT:

```
list elements:
[12, 5, 20, 4, 1]
square list:
[144, 25, 400, 16, 1]
```

4.Form a list of vowels selected from a given word.

PROGRAM:

```
new=input("Enter any word:")                    #reading a word from input
vowels=['a','e','i','o','u']                   #declaring a list of vowels
list1=[]
for x in new:                                   #iterating each element in  new
   if (x in vowels and x not in list1):         #checking the condition
      list1.append(x)
print("Vowels present in given word:",list1)
```

OUTPUT:

```
Enter any word:questions
Vowels present in given word: ['u', 'e', 'i', 'o']
```

5.List ordinal value of each element of a word (Hint: use ord() to get ordinal values)

PROGRAM:

```
x=input("enter a word:")
for a in x:                                    #iterating each element in x
   print("ordinal value of ",a,"is ",ord(a))   #printing the ordinal values of each element  in x
```

OUTPUT:

```
enter a word:happy
ordinal value of  h is  104
ordinal value of  a is  97
ordinal value of  p is  112
ordinal value of  p is  112
ordinal value of  y is  121
```

LAB CYCLE 1.2

1.Count the occurrences of each word in a line of text.

PROGRAM:

```
def word_count(str):
  words=str.split()
  counts=dict()
  for word in words:
    if word in counts:
      counts[word]=counts[word]+1
    else:
      counts[word]=1
  return counts

new=input("Enter a string: ")
print(word_count(new))
```

OUTPUT:

```
Enter a string: stay home stay safe
{'home': 1, 'stay': 2, 'safe': 1}
```

2.Prompt the user for a list of integers. For all values greater than 100, store ‘over’ instead.

PROGRAM:

```
list=[]
n=int(input("Enter the number of elements: "))
for i in range(0,n):
  elem=int(input("Enter the element: "))
  if(elem>100):
    list.append("over")
  else:
    list.append(elem)
print(list)
```

OUTPUT:

```
Enter the number of elements: 4
Enter the element: 56
Enter the element: 101
Enter the element: 23
Enter the element: 99
[56, 'over', 23, 99]
```

3.Store a list of first names. Count the occurrences of ‘a’ within the list.

PROGRAM:

```
list=['aleena','megha','akhila','kavya']
count=0
for name in list:
   for i in name:
      if(i=='a'):
         count=count+1
print("The list is:",list)
print("occurrence of 'a': ",count)
```

OUTPUT:

```
The list is: ['aleena', 'megha', 'akhila', 'kavya']
occurrence of 'a':  7
```

4) Enter 2 lists of integers. Check
(a) Whether list are of same length
(b) Whether list sums to same value
(c) Whether any value occurs in both

PROGRAM:

```
list1=[4,7,9,34]
list2=[2,8,9,22]
print("list1=",list1)
print("list2=",list2)
if(len(list1)==len(list2)):
   print("List are in same length")
else:
   print("List are not  in same length")
if(sum(list1)==sum(list2)):
   print("List sum are equal")
else:
   print("List sum are not equal")
output=any(check in list2 for check in list1)
print("common value: ",output)
```

OUTPUT:

```
list1= [4, 7, 9, 34]
list2= [2, 8, 9, 22]
List are in same length
List sum are not equal
common value:  True
```

5.Get a string from an input string where all occurrences of first character replaced with ‘$’,except first character. [eg: onion -> oni$n]

PROGRAM:

```
string=input("Enter a string:")
word=list(string)
ch=string[0]
length=len(string)
for i in range(1,length):
   if(word[i]==ch):
      word[i]='$'
print(word)
```

OUTPUT:

```
Enter a string:onion
['o', 'n', 'i', '$', 'n']
```

LAB CYCLE 1.3

1.Create a string from given string where first and last characters exchanged. [eg: python -&#gt; nythop]

PROGRAM:

```
str=input("Enter a string: ")
start=str[0]
end=str[-1]
str=end+str[1:-1]+start
print(str);
```

OUTPUT:

```
Enter a string: python
nythop
```

2.Accept the radius from user and find area of circle.

PROGRAM:

```
radius=int(input("Enter the radius of the circle: "))
pi=3.14
area=pi*radius*radius
print("Area of the circle is ",area)
```

OUTPUT:

```
Enter the radius of the circle: 4
Area of the circle is  50.24
```

3.Find biggest of 3 numbers entered.

PROGRAM:

```
n1=int(input("Enter the first number:"))
n2=int(input("Enter the second number:"))
n3=int(input("Enter the third number:"))
if((n1>n2)and(n1>n3)):
   print("the biggest number is ",n1)
elif((n2>n1)and(n2>n3)):
   print("the biggest number is ",n2)
else:
   print("the biggest number is ",n3)
```

OUTPUT:

```
Enter the first number:4
Enter the second number:5
Enter the third number:2
the biggest number is  5
```

4.Accept a file name from user and print extension of that

PROGRAM:

```
filename=input("Input the Filename: ")
file_ext = filename.split(".")
print("The extension of the file is: ",file_ext[-1])
```

OUTPUT:

```
Input the Filename: sum.java
The extension of the file is:  java
```

5.Create a list of colors from comma-separated color names entered by user. Display first and last colors

PROGRAM:

```
a=input("Enter the colors:")
color_list=a.split(",")
print(color_list)
print("First color:",color_list[0])
print("Last color:",color_list[-1])
```

OUTPUT:

```
Enter the colors:yellow,green,blue,white
['yellow', 'green', 'blue', 'white']
First color: yellow
Last color: white
```

6.Accept an integer n and compute n+nn+nnn.

PROGRAM:

```
n=int(input("Enter a number n:"))
temp=str(n)
t1=temp+temp
t2=temp+temp+temp
comp=n+int(t1)+int(t2)
print("The value is:",comp)
```

OUTPUT:

```
Enter a number n:5
The value is: 615
```

7. Print out all colors from color-list1 not contained in color-list2.

PROGRAM:

```
color_list1=set(["yellow","pink","blue","green"])
color_list2=set(["white","pink","black","orange"])
print(color_list1-color_list2)
```

OUTPUT:

```
{'yellow', 'green', 'blue'}
```

8.Create a single string separated with space from two strings by swapping the character at position 1.

PROGRAM:

```
def swap(a, b):
   new_a=b[0] + a[1:]
   new_b = a[0] + b[1:]
   print("string:",a+"",b)
   print("After swapping first position:")
   return new_a+" "+ new_b
print(swap('stay', 'home'))
```

OUTPUT:

```
string: stay home
After swapping first position:
htay some
```

9.Sort dictionary in ascending and descending order.

PROGRAM:

```
y={'aleena':4,'megha':2,'kavya':1,'chithra':3}
l=list(y.items())
l.sort()
print("Ascending order: ",l)
l=list(y.items())
l.sort(reverse=True)
print("Descending order: ",l)
dict=dict(l)
print("Dictionary:",dict)
```

OUTPUT:

```
Ascending order:  [('aleena', 4), ('chithra', 3), ('kavya', 1), ('megha', 2)]
Descending order:  [('megha', 2), ('kavya', 1), ('chithra', 3), ('aleena', 4)]
Dictionary: {'megha': 2, 'aleena': 4, 'chithra': 3, 'kavya': 1}
```

10.Merge two dictionaries

PROGRAM:

```
d1 = {'India':5,'Canada':6,'Japan':2}
d2 = {'France':1,'Malaysia':3}
d3 = d1.copy()
for key, value in d2.items():
   d3[key] = value
print("d1=",d1)
print("d2=",d2)
print("After Merging:",d3)
```

OUTPUT:

```
d1= {'Japan': 2, 'Canada': 6, 'India': 5}
d2= {'France': 1, 'Malaysia': 3}
After Merging: {'Japan': 2, 'Malaysia': 3, 'France': 1, 'Canada': 6, 'India':
5}
```

11.Find gcd of 2 numbers.

PROGRAM:

```
n1=int(input("Enter first number:"))
n2=int(input("Enter second number:"))
i=1
while(i<=n1 and i<= n2):
   if(n1%i==0 and n2%i==0):
      gcd=i
   i=i + 1
print("GCD is", gcd)
```

OUTPUT:

```
Enter first number:48
Enter second number:24
GCD is 24
```

12. From a list of integers, create a list removing even numbers

PROGRAM:

```
num = [17,80, 12, 25, 44, 21, 37]
new=[]
print(num)
for i in num:
    if(i%2!=0):
       new.append(i)
print("After removing even numbers:",new)
```

OUTPUT:

```
[17, 80, 12, 25, 44, 21, 37]
After removing even numbers: [17, 25, 21, 37]
```

LAB CYCLE 2.1

1. Program to find the factorial of a number

PROGRAM:

```
num = int(input("Enter a number: "))
factorial = 1
if num < 0:
  print("Sorry, factorial does not exist for negative numbers")
elif num == 0:
  print("The factorial of 0 is 1")
else:
  for i in range(1,num + 1):
    factorial = factorial*i
  print("The factorial of",num,"is",factorial)
```

OUTPUT:

```
Enter a number: 4
The factorial of 4 is 24
```

2.Generate Fibonacci series of N terms

PROGRAM:

```
nterms = int(input("How many terms? "))
n1, n2 = 0, 1
count = 0
if nterms <= 0:
  print("Please enter a positive integer")
elif nterms == 1:
  print("Fibonacci sequence upto",nterms,":")
  print(n1)
else:
  print("Fibonacci sequence:")
  while count < nterms:
     print(n1)
     nth = n1 + n2
     n1 = n2
     n2 = nth
     count += 1
```

OUTPUT:

```
How many terms? 7

Fibonacci sequence:

0

1

1

2

3

5

8
```

3.Find the sum of all items in a list .

PROGRAM:

```
list=[]
n=int(input("Enter the number of items in the list:" ))
for i in range(0,n):
   list.append(int(input("Enter the element:" )))
print("list=",list)
sum=0
for i in list:
   sum=sum+i
print("sum of all items in the list=",sum)
```

OUTPUT:

```
Enter the number of items in the list:4
Enter the element:33
Enter the element:22
Enter the element:11
Enter the element:44
list= [33, 22, 11, 44]
sum of all items in the list= 110
```

4.Generate a list of four digit numbers in a given range with all their digits even and the number

is a perfect square.

```
list=[]
for i in range(1000,10000):
   for j in range(32,100):
      if(i==j*j):
         string=str(i)
         if((int(string[0])%2==0)and (int(string[1])%2==0)and
         (int(string[2])%2==0)and(int(string[3])%2==0)):

              list.append(i)
print(list)
```

OUTPUT:

```
[4624, 6084, 6400, 8464]
```

5. Display the given pyramid with step number accepted from user. Eg: N=4 1 2 4 3 6 9 4 8 12 16

PROGRAM:

```
n=int(input("Enter the step number:"))
for i in range(1, n+1):
    for j in range(1, i + 1):
        print(i * j, end='  ')
    print()
```

OUTPUT:

```
Enter the step number:4
1
2  4
3  6  9
4  8  12  16
```

6. Count the number of characters (character frequency) in a string.

PROGRAM:

```
str=input("Enter the string: ")
dict={}
for n in str:
    keys=dict.keys()
    if n in keys:
      dict[n] += 1
    else:
      dict[n] = 1
print(dict)
```

OUTPUT:

```
Enter the string: dhanya
{'h': 1, 'n': 1, 'y': 1, 'd': 1, 'a': 2}
```

LAB CYCLE 2.2

1. Add ‘ing’ at the end of a given string. If it already ends with ‘ing’, then add ‘ly’

PROGRAM:

```
str=input("enter a string:")
x=str[-3:]
if(x=="ing"):
  print(str+"ly")
else:

  print(str+"ing")
```

OUTPUT:

```
Enter a string:walking
walkingly
```

2. Accept a list of words and return length of longest word.

PROGRAM:

```
def find_longest_word(words_list):
   word_len=[]
   for n in words_list:
      word_len.append((len(n), n))
   word_len.sort()
   return word_len[-1][0], word_len[-1][1]
words_list=[]
for i in range(0,4):
   words_list.append(input("Enter a word:"))
print(words_list)
result=find_longest_word(words_list)
print("\nLongest word: ",result[1])
print("Length of the longest word: ",result[0])
```

OUTPUT:

```
Enter a word:dhanya
Enter a word:kavya
Enter a word:saranya
Enter a word:aleena
['dhanya', 'kavya', 'saranya', 'aleena']

Longest word:  saranya
Length of the longest word:  7
```

3. Construct following pattern using nested loop

```
*
* *
* * *
* * * *
* * * * *
* * * *
* * *
* *
*
```

PROGRAM:

```
for i in range(n):
   for j in range(i):
      print ('* ', end="")
   print()

for i in range(n,0,-1):
   for j in range(i):
      print('* ', end="")
   print()
```

OUTPUT:

4. Generate all factors of a number.

PROGRAM:

```
n=int(input("Enter a number:"))
print("factors of ",n,"is:")
i=1
while(i<=n):
   if(n%i==0):
      print(i)
   i=i+1
```

OUTPUT:

```
Enter a number:64
factors of  64 is:
1
2
4
8
16
32
64
```

5. Write lambda functions to find area of square, rectangle and triangle.

PROGRAM:

```
square=lambda x:x*x
rectangle=lambda x,y:x*y
triangle=lambda b,h:0.5*b*h
print("Area of square",square(3))
print("Area of rectangle",rectangle(3,4))
print("Area of triangle",triangle(4,5))
```

OUTPUT:

```
Area of square 9
Area of rectangle 12
Area of triangle 10.0
```