# FEDERAL INSTITUTE OF SCIENCE AND TECHNOLOGY $(FISAT)^{\text{TM}}$

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**ANGAMALY-683577** 



### 'FOCUS ON EXCELLENCE'

# LABORATORY RECORD 20MCA131-PROGRAMMING LAB

Name: CHRISTEENA PAUL

**Branch: MASTER OF COMPUTER APPLICATIONS** 

Semester: 1 Batch: 2021- A Roll No: 48

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### **SCIENCE AND TECHNOLOGY**

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University Exam.Reg. No: FIT21MCA-2048

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1	10/11/21	Display future leap years from current year to a final year entered by user.		
2	10/11/21	List comprehensions:(a)Generate positive list of numbers from a given list of integers(b)Square of N numbers(c)Form a list of vowels selected from a given word(d)List ordinal value of each element of a word		
3	25/11/21	Count the occurrences of each word in a line of text.		
4	11/11/21	Prompt the user for a list of integers. For all values greater than 100, store 'over' instead.		
5	11/11/21	Store a list of first names. Count the occurrences of 'a' within the list		
6	17/11/21	Enter 2 lists of integers. Check(a) Whether list are of same length(b) whether list sums to same value(c) whether any value occur in both		
7	25/11/21	Get a string from an input string where all occurrences of first character replaced with '\$', except first character.		
8	25/11/21	Create a string from given string where first and last characters exchanged.		
9	28/11/21	Accept the radius from user and find area of circle.		
10	28/11/21	Find biggest of 3 numbers entered.		
11	25/11/21	Accept a file name from user and print extension of that.		
12	17/11/21	Create a list of colors from comma-separated color names entered by user. Display first and last colors.		
13	2/12/21	Accept an integer n and compute n+nn+nun.		
14	17/11/21	Print out all colors from color-list 1 not contained in color-list2.		
15	2/12/21	Create a single string separated with space from two strings by swapping the character at position 1.		

16	2/12/21	Sort dictionary in ascending and descending order.	
17	2/12/21	Merge two dictionaries.	
18	25/11/21	Find gcd of 2 numbers.	
19	17/11/21	From a list of integers, create a list removing even numbers.	
20	28/10/21	Program to find the factorial of a number	
21	28/10/21	Generate Fibonacci series of N terms	
22	2/12/21	Find the sum of all items in a list	
23	2/12/21	Generate a list of four digit numbers in a given range with all their digits even and the number is a perfect square.	
24	2/12/21	Display the given pyramid with step number accepted from user	
25	2/12/21	Count the number of characters (characterfrequency) in a string.	
26	2/12/21	Add 'ing' at the end of a given string. If it already ends with 'ing', then add 'ly'	
27	2/12/21	Accept a list of words and return length of longest word.	
28	2/12/21	Construct following pattern using nested loop	
29	2/12/21	Generate all factors of a number.	
30	20/01/22	Create a package graphics with modules rectangle, circle and sub-package 3D-graphics with modules cuboid and sphere. Include methods to find area and perimeter of respective figures in each module. Write programs that finds area and perimeter of figures by different importing statements.	
31	9/12/21	Create Rectangle class with attributes length and breadth and methods to find area and perimeter. Compare two Rectangle objects by their area.	
32	9/12/21	Create a Bank account with members account number, name, type of account and balance. Write constructor and methods to deposit at the bank and withdraw an amount from the bank.	
33	16/12/21	Create a class Rectangle with private attributes length and width. Overload '<' operator to compare the area of 2 rectangles.	

34	13/01/22	Create a class Time with private attributes hour, minute and second. Overload '+' operator to find sum of 2 time.				
35	20/01/22	Create a class Publisher (name). Derive class Book from Publisher with attributes title and author. Derive class Python from Book with attributes price and no_of ages. Write a program that displays information about a Python book. Use base class constructor invocation and method overriding.				
36	27/01/22	Write a Python program to read a file line by line and store it into a list.				
37	27/01/22	Write a Python program to read each row from a given csv file and print a list of strings.				

# **Course Outcome 1(CO1)**

# **AIM**

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

# Input

```
#leap
print ("Enter last year")
endYear = int(input())
print ("List of leap years:")
for year in range(2021, endYear+1):
    if (year % 4 == 0 ) and (year % 100 != 0) or (year % 400 == 0):
        print (year)
```

# **Output**

```
Enter the current year:2021
Enter the year limit:2030
The leap years are
2024
2028
```

- 2.List comprehensions:
- (a) Generate positive list of numbers from a given list of integers.

# Input

```
#positive no in list
list1=[0,-1,-2,3,4,1,2,5]
    for num in list1:
        if (num>=0):
        print(num)
```

# **Output**

```
Positive list of numbers [1, 4, 6, 3, 90]
```

(b)Square of N numbers

# Input

```
#Square of n numbers
list1=[3,56,6]
list2=[]
print("The squares of the given numbers are:")
for i in list1:
    s=(i*i) print(s)
```

# **Output**

```
Enter the limit:5

1 * 1 = 1

2 * 2 = 4

3 * 3 = 9

4 * 4 = 16

5 * 5 = 25
```

(c)Form a list of vowels selected from a given word

# Input

# **Output**

```
Enter the word:Input
vowels are: ['I', 'u']
```

(d)List ordinal value of each element of a word

# Input

```
#ordinal value
word=input('Enter the string:')
print([ord(x) for x in word])
```

# **Output**

```
Enter the string:pen
Ordinal value
p = 112
e = 101
n = 110
```

Count the occurrences of each word in a line of text. **Input** 

```
list1=[]
list2=[]
x=input("Enter a string:")
for i in x.split(" "):
    list1.append(i)
    if i not in list2:
        list2.append(i)
for i in list2:
    print(i,"\t",list1.count(i))
```

# **Output**

Enter the string:a set of words that is complete in itself A sentence is a set of words that contain {'a': 2, 'set': 2, 'of': 2, 'words': 2, 'that': 2, 'is': 2, 'complete': 1, 'in': 1, 'itself': 1, 'A': 1, 'sentence': 1, 'contain': 1}

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

# Input

```
#store over for values>100
w=int(input('Enter the limit:'))
list1=[]
for i in range(0,w):
        value=int(input('Enter the values:'))
        if(value>100):
            list1.append('over')
        else:
            list1.append(value)
print(list1)
```

# **Output**

```
Enter the limit:4
Enter the values:12
Enter the values:102
Enter the values:201
Enter the values:45
[12, 'over', 'over', 45]
```

# **AIM**

Store a list of first names. Count the occurrences of 'a' within the list.

# Input

```
#counta word=['anna','anu']
r=0
for d in word:
    for c in d:
        if (c=='a'):
        r=r+1
print(r)
```

# **Output**

Occurance of a in the given list is 3

# **AIM**

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

## Input

```
#lensame 11=[1,2,3,4,5]
     12=[6,3,21,6,1]
     p=len(l1)
     q=len(12)
     if(p==q):
           print("The length of two lists are same")
     else:
           print("The length of lists are not same")
     s=0
     0=q
     for i in l1:
           s=s+i
     print("Sum of list1 is",s)
     for r in I2:
           p=p+r
     print("Sum of list2 is",p)
        if(s==p):
           print("Sum of elements in two lists are same")
     else:
           print("Sum of elements in two lists are not same")
     13=[1
     f=0
     for i in l1:
          if i in I2:
                13.append(i)
                 f=f+1
     print(I3)
     if(f==0):
           print("no element is same")
Output
The length of lists are not same
Sum of list1 is 15
Sum of list2 is 36
Sum of elements in two lists are not same
values that occur in both list: [3]
```

Get a string from an input string where all occurrences of first character replaced with '\$', except first character.

# Input

```
#character replace
str1=input("Enter a string:")
print("Original string:",str1)
char=str1[0]
str1=str1.replace(char,'$')
str1=char+str1[1: ]
print("Replaced string: ",str1)
```

# **Output**

```
Enter a string:onion
Original string: onion
Replaced string: oni$n
```

Create a string from given string where first and last characters exchanged.

# Input

```
#First and last character exchange
str=input("Enter a string:")
char=str[0]
char1=str[-1]
n=len(str)
ns=char1+str[1:n-1]+char print(ns)
```

# **Output**

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

```
AIM
```

Accept the radius from user and find area of circle.

```
Input
```

```
#Area of the circle
x=int(input('Enter the radius:'))
A=3.14*x*x
print("Area of the circle is",A)
```

# **Output**

```
Enter the radius:2
Area of the circle is 12.56
```

### **AIM**

Find biggest of 3 numbers entered.

# Input

```
#biggest of 3 nos
a=int(input('Enter the first number:'))
b=int(input('Enter the second number:'))
c=int(input('Enter the third number:'))
if a>b:
        if a>c:
            print(a)
        else:
            if(b>c):
            print(b)
else:
        print(c)
```

# Output

```
Enter the first number:2
Enter the second number:5
Enter the third number:6
Biggest of the three number is:
6
```

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

# Input

```
#extention of file
import os
a=input("Enter the file name\n")
print(os.path.splitext(a))
```

## **Output**

```
Enter the file name:12col.py
The extention of file 12col.py is ('12col', '.py')
```

### **AIM**

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

# Input

```
#first and last colours

I1=['Red','blue','white','yellow','Black']
print("First and last colours in the list are:")
print(I1[0],'and',I1[-1])
```

# Output

```
First and last colours in the list are: Red and Black
```

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

# Input

```
#computing n+nn+nnn
x=int(input("enter the numbers"))
a=str(x)
b=a+a
c=a+a+a
d=x+int(b)+int(c)
print(d)
```

# Output

```
Enter a number:2 246
```

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

# Input

# **Output**

```
colours not in l2 is:
['blue', 'black']
```

### **MIA**

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

# Input

```
#swapping
str1=input("Enter first string:")
str2=input("Enter second string:")
str3=str2[0]+str1[1:]+" "+str1[0]+str2[1:]
print(str3)
```

# **Output**

```
Enter first string:code
Enter second string:Analysis
Aode cnalysis
```

Sort dictionary in ascending and descending order.

# Input

```
#ascending and descending order
d1={"annie":1,"carolin":3,"danic":2,"baachu":4}
l=list(d1.items())

print("orginal list is",I)
l.sort()
print("Ascending order is\n",I)
l=list(d1.items())
l.sort(reverse=True)
print("Desencding order is\n",I)
```

# **Output**

```
orginal list is [('annie', 1), ('carolin', 3), ('danic', 2), ('baachu', 4)] Ascending order is [('annie', 1), ('baachu', 4), ('carolin', 3), ('danic', 2)] Desencding order is [('danic', 2), ('carolin', 3), ('baachu', 4), ('annie', 1)]
```

# **Course Outcome 2(CO2):**

### **AIM**

Program to find the factorial of a number.

# Input

```
#co21factorial of a number
n=int(input('Enter the number:'))
fact=1
for i in range(1,n+1):
    fact=fact*i
print(fact)
```

# **Output**

```
Enter the number:4
```

Generate Fibonacci series of N terms.

# Input

```
#co22fibanocciseries
n=int(input('Enter number of terms:'))
f1=0
f2=1
print(f1,f2)
for i in range(0,n):
    f3=f1+f2
    print(f3)
    f1=f2
    f2=f3
```

# **Output**

```
Enter number of terms:4
0
1
1
2
3
```

Find the sum of all items in a list.

# Input

```
#sum of items in list 11=[1,2,3,4] 13=[] s=0 p=0 for i in 11: s=s+i print("Sum of list1 is",s)
```

# Output

Sum of list1 is 10

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

# Input

```
limit1=1000
limit2=9999
list1=[]
for i in range(limit1,limit2):
      j=i
      digit=[]
      while(i!=0):
            digit.append(i%10)
            i=int(i/10)
      count=0
      for n in digit:
            if n\%2 = = 0:
                   count=count+1
      if count==4:
            for k in range(31,100):
                   if((k**2)==j):
                          list1.append(j)
                          print(k)
print(list1)
```

# Output

```
68
78
80
92
[4624, 6084, 6400, 8464]
```

Display the given pyramid with step number accepted from the user.

```
Eg: N=4 1
2 4
3 6 9
4 8 12 16
```

# Input

```
#pyramid with step no
n=int(input('enter the step number'))
for i in range(1,n+1):
    for j in range(1,i+1):
        s=i*j
        print(s,'\t',end="")
    print("\n")
```

# **Output**

```
Enter the step no:4

2     4

3     6     9

4     8     12     16
```

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

# Input

```
#character frequency

str=input("Enter a string:")

fnd=input("Enter character:")

cnt=0

fnd=fnd.lower()

str=str.lower()

for i in str:

    if i==fnd:
        cnt=cnt+1

print("Freq:→",cnt)
```

# **Output**

```
Enter a string:India is our Nation
Enter character:i
Freq:-> 4
```

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

# Input

# **Output**

```
Enter a string:writing
writingly
```

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

# Input

```
#Length of the longest
word
         lis=[]
         n=int(input("Enter
         the range:"))
         print("Enter the
         words:")
         for i in
         range(0,
         n):
         lis.appe
         nd(input
         (""))
         longest
         =lis[0]
         for i in
           range(1,n):
           if(len(lis[i])
           >len(longe
           st)):
           longest=lis
           [i]
         print("Length of longest word is",len(longest))
```

# **Output**

```
Enter the range:4
Enter the words:
India
Sreelanka
Iran
America
Length of longest word is 9
```

```
Construct following pattern using nested loop.
```

# Input

# **Output**

```
*

**

**

***

***

**

**

**

**
```

Generate all factors of a number.

# Input

```
#All factors of a no
n=int(input("Enter a number:"))
print("Factors are")

for i in     range(1,n+1):
     if(n%i==0):
         print(i)
```

# **Output**

```
Enter a number:6
Factors are
1
2
3
6
```

# **Course Outcome 3(CO3):**

### **AIM**

Create a package graphics with modules rectangle, circle and subpackage 3D-graphics with modules cuboid and sphere. Include methods to find area and perimeter of respective figures in each module. Write programs that finds area and perimeter of figures by different importing statements.

# Input

## Graphics\circle.py

```
from math import pi

def area_circle(radius):
    return pi*radius*radius

def perimeter_circle(radius):
    return 2*pi*radius
```

# **Graphics**\rectangle.py

```
def area_rec(length,width):
    return length*width

def perimeter_rec(length,width):
    return 2*(length+width)
```

# **Graphics\tdgraphics\cuboid.py**

```
def area_cuboid(I,b,h):
    return 2*(I*h + b*h + I*b)

def volume_cuboid(I,b,h):
    return I*b*h
```

# **Graphics\tdgraphics\sphere.py**

```
from math import pi

def area_sphere(radius):
    return 4*(pi*radius*radius)

def perimeter_sphere(radius):
    return 2*pi*radius
```

# **Graphics.py** (driver code)

```
import graphics
from graphics import circle, rectangle
from graphics.tdgraphics import cuboid,sphere
from graphics.circle import *
print("Area of a circle with radius 20 is: ",circle.area circle(20))
print("Permeter of a circle with radius 20 is
",circle.perimeter circle(20))
print("\n")
print("Area of a Rectangle with length 20 and width 10 is:
",rectangle.area rec(20,10))
print("Permeter of a Rectangle with length 20 and width 10 is:
",rectangle.perimeter rec(20,10))
print("\n")
print("Area of a cuboid with length, width, height 8 is:
",cuboid.area cuboid(8,8,8))
print("Volume of a cuboid with length, width, height 12 is:
",cuboid.volume cuboid(12,12,12))
print("\n")
print("Area of a spere with radius 20 is: ",sphere.area sphere(20))
print("Permeter of a spere with radius 20 is
",sphere.perimeter sphere(20))
```

```
Output
PS D:\mySpace\learn> cd python
PS D:\mySpace\learn\python> md Graphics
    Directory: D:\mySpace\learn\python

        Mode
        LastWriteTime
        Length Name

        d----
        28-02-2022 08.29 PM
        Graph

                                             Graphics
PS D:\mySpace\learn\python> cd Graphics
PS D:\mySpace\learn\python\Graphics> notepad __init__.py
PS D:\mySpace\learn\python\Graphics> notepad circle.py
PS D:\mySpace\learn\python\Graphics> notepad rectangle.py
PS D:\mySpace\learn\python\Graphics> md tdgraphics
    Directory: D:\mySpace\learn\python\Graphics

        Mode
        LastWriteTime
        Length Name

        d-----
        28-02-2022 08.32 PM
        tdgra

                                       tdgraphics
market and a second to second and a best about the conditions and a description.
PS D:\mySpace\learn\python> python graphics.py
Area of a circle with radius 10 is : 314.1592653589793
Permeter of a circle with radius 10 is 62.83185307179586
Area of a Rectangle with length and width 10 is: 100
Permeter of a Rectangle with length and width 10 is : 40
 Area of a cuboid with length, width, height 10 is: 600
Volume of a cuboid with length, width, height 10 is: 1000
 Area of a spere with radius 10 is : 1256.6370614359173
 Permeter of a spere with radius 10 is 62.83185307179586
PS D:\mySpace\learn\python>
```

# **Course Outcome 4(CO4):**

### **AIM**

Create Rectangle class with attributes length and breadth and methods to find area and perimeter. Compare two Rectangle objects by their area.

# Input

```
class Rectangle:
      def init (self,l,b):
        self.l=l
        self.b=b
       def area(self):
        return (self.l*self.b)
      def perimeter(self):
        return 2*(self.l+self.b)
p=int(input("Enter length of first rectangle:"))
q=int(input("Enter breadth of first rectangle:"))
r=int(input("Enter length of second rectangle:"))
s=int(input("Enter breadth of second rectangle:"))
r1=Rectangle(p,q)
r2=Rectangle(r,s)
x=r1.area()
y=r2.area()
z=r1.perimeter()
h=r2.perimeter()
if(x>y):
      print("Area of first rectangle is greater")
else:
      print("Area of second rectangle is greater")
print("Perimeter of first rectangle is",z)
print("Perimeter of second rectangle is",h)
```

# Output Enter length of first rectangle:5 Enter breadth of first rectangle:4 Enter length of second rectangle:3 Enter breadth of second rectangle:2 Area of first rectangle is greater Perimeter of first rectangle is 18 Perimeter of second rectangle is 10 Federal Institute of Science and Technology (FISAT) ™ Page no 39

Create a Bank account with members account number, name, type of account and balance. Write constructor and methods to deposit at the bank and withdraw an amount from the bank.

# Input

```
class Bank:
      def __init__(self,acno,name,typeofac,balance):
              self.acno=acno
              self.name=name
              self.typeofac=typeofac
              self.balance=balance
       def withdraw(self.x):
              self.balance=self.balance-x
              print("Balance is:",self.balance)
      def deposit(self,y):
              self.balance=self.balance+y
              print("Balance is:",self.balance)
ac1=Bank(1,"Aiswarya","SB",10000)
ac2=Bank(2,"Krishnenthu","SB",20000)
p=int(input("Enter amount to withdraw:"))
q=int(input("Enter amount to deposit:"))
r=int(input("Enter amount to withdraw:"))
ac1.withdraw(p)
ac2.deposit(q)
ac1.deposit(r)
```

# Output Enter amount to withdraw:1000 Enter amount to deposit:2000 Enter amount to withdraw:2000 Balance is: 9000 Balance is: 22000 Balance is: 11000 Federal Institute of Science and Technology (FISAT) ™ Page no 41

Create a class Rectangle with private attributes length and width. Overload '<'operator to compare the area of 2 rectangles.

```
Input
     class Rectangle:
           def init (self,length,breadth):
                self. length=length
                self. breadth=breadth
           def area(self):
                 a=self. length*self. breadth
                 print("area",a)
                return a
           def perimeter(self):
                p=2*(self._length+self._breadth)
                print("perimeter",p)
           def It (self,rr):
           if(self. breadth*self. length>rr. breadth*rr. length):
                      return True
                 else:
                      return False
     r1=Rectangle(5,7)
     r2=Rectangle(4,6)
     if(r1<r2):
           print("Area of first rectangle is greater")
     else:
           print("Area of second rectangle is greater")
 Output
Area of first rectangle is greater
```

Create a class Time with private attributes hour, minute and second. Overload '+' operator to find sum of 2 time.

# Input

```
class Time:

def __init__(self,hr,min,sec):

self.hr=hr

self.min=min

self.sec=sec

def __add__(t1,t2):

hr=t1.hr+t2.hr

min=t1.min+t2.min

sec=t1.sec+t2.sec

print("The Sum of Two Times is",hr,":",min,":",sec)

t1=Time(2,30,46)

t2=Time(4,20,2)

t1+t2
```

# **Output**

```
The Sum of Two Times is 6 : 50 : 48
```

Create a class Publisher (name). Derive class Book from Publisher with attributes title and author. Derive class Python from Book with attributes price and no\_of ages. Write a program that displays information about a Python book. Use base class constructor invocation and method overriding.

## Input

Page no 44

```
class Publisher:
            def init (self,name):
                  self.name=name
      class Book(Publisher):
            def init (self,name,title,author):
                  super(). init (name)
                  self.title=title
                  self.author=author
      class Python(Book):
            def init (self,name,title,author,price,no of pages):
                  super(). init (name,title,author)
                  self.price=price
                  self.no of pages=no of pages
            def display(self):
                  print("Name:",self.name)
                  print("Title:",self.title)
                  print("Author:",self.author)
                  print("Price:",self.price)
                  print("No of pages:",self.no of pages)
      p1=Python("Times publications", "Python
      Programming", "Mr. James", 480, 210)
      p1.display()
Federal Institute of Science and Technology (FISAT) ™
```

# Output Name: Times publications Title: Python Programming Author: Mr.James Price: 480 No of pages: 210 Federal Institute of Science and Technology (FISAT) ™ Page no 45

# **Course Outcome 5(CO5):**

### **AIM**

Write a Python program to read a file line by line and store it into a list. **Input** 

```
fp=open("text_file.txt",'r') lines=[]
    for line in fp:
```

lines.append(line.strip()) print(lines)ut

## Output

PS C:\Users\HP\OneDrive\Desktop\python\co5> python qn1.py
['"Cats, also called domestic cats are small, carnivorous mammals, of the family Felidae.', "Domestic cat s are often called 'house cats' when kept as indoor pets.", 'Cats have been domesticated for nearly 10,00 0 years.', 'They are one of the most popular pets in the world."']
PS C:\Users\HP\OneDrive\Desktop\python\co5> [

Write a Python program to read each row from a given csv file and print a list of strings.

# Input

```
import csv
with open('people.csv', 'r') as file:
    reader = csv.reader(file)
    for row in reader:
        print(row)
```

# **Output**

```
PS C:\Users\HP\OneDrive\Desktop\python\co5> python qn2.py
['Name', 'Designation', 'Salary']
['Jessy', 'Manager', '90000']
['Tom', 'Clerk', '40000']
['Alfred', 'Assistant Manager', '70000']
PS C:\Users\HP\OneDrive\Desktop\python\co5> [
```