**Course Outcome 1**

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

**PROGRAM**

#print leap year between two given years

print("print leap year between two given years")

print("Enter start year")

startYear=int(input())

print("Enter last year")

endYear=int(input())

print("List of leap years:")

#loop through between the start and end year

for year in range(startYear,endYear):

#check if the year is a leap year if yes print

if((year%4==0)and(year%100!=0)or

(year%400==0)):

print(year)

**OUTPUT**

print leap year between two given years

Enter start year

1997

Enter last year

2021

List of leap years:

2000

2004

2008

2012

2016

2020

**2)List comprehensions:**

**(a) Generate positive list of numbers from given list of integers**

# Python program to print positive Numbers in a List

# list of numbers

list1 = [11, -21, 0, 45, 66, -93]

# iterating each number in list

for num in list1:

# checking condition

if num >= 0:

print(num, end = " ")

**OUTPUT**

11 0 45 66

**(b) Square of N numbers**

#Squares of N numbers

print("Enter the limit:")

n=int(input())

squares=[i\*i for i in range(n)]

print("Square of n numbers \n",squares)

**OUTPUT**

Enter the limit:

3

Square of n numbers

[0, 1, 4]

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

**PROGRAM**

word=input('Enter your word:')

for letter in word:

if letter in 'aeiou':

print(letter,end='')

**OUTPUT**

Enter your word:arya pradeep

Aaaee

|  |
| --- |
|  |

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

**PROGRAM**

The orginal list:

['shee', 'lee', 'reshi']

The ascii list is :

[115, 104, 101, 101, 108, 101, 101, 114, 101, 115, 104, 105]

**OUTPUT**

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

**PROGRAM**

#count the occurrences of each word in a line of text

line=input("Enter the line:")

counts={}

sentence=line.split()

for word in sentence:

if word in counts:

counts[word]+=1

else:

counts[word]=1

for k,v in counts.items():

print(k,v)

**OUTPUT**

Enter the line: count the occurrences of each word in a line of text

count 1

the 1

occurrences 1

of 2

each 1

word 1

in 1

a 1

line 1

text 1

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

**PROGRAM**

list=[100,120,230,340,50]

result=[]

for i in list:

if i>100:

result.append('over')

else:

result.append(i)

print(result)

**6) Store a list of first names. Count the occurrence of ’a’ with in the list.**

**PROGRAM**

Astr=input("enter the string \n")

char=input("enter the character\n")

print("given string:\n",Astr)

print("given character:\n",char)

res=0

for i in range(len(Astr)):

#checking character in string

if (Astr[i]==char):

res=res+1

print("number of time character is present in string:\n",res)

**OUTPUT**

Enter the string

arya

Enter the character

a

Given string:

arya

Given character:

a

Number of time character is present in string:

1

Number of time character is present in string:

2

**7) Enter 2 list of integers. Check (a) whether list are of same length(b) whether any value occure in both.**

**8) Get a string from an input string where all occurrences of first character replaced with ‘$’,except first character.**

**[eg:onion->oni$n]**

**PROGRAM**

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: arya

Original String: arya

Replaced String: ary$

**9.Create a string from given string where first and last Characters exchanged. [eg:python->nythop]**

**PROGRAM**

str1=input("enter a string:")

print("string after swapping first and last character:" ,(str1[-1:] + str1[1: -1] + str1[:1]))

**OUTPUT**

str1=input("enter a string:")

print("string after swapping first and last character:" ,(str1[-1:] + str1[1: -1] + str1[:1]))

**10) Accept the radius from user and find area of circle.**

**PROGRAM**import math

r = float(input("Input the radius of the circle:"))

print("The area of the circle with radius ",r,"is:",(math.pi\*r\*\*2))

**OUTPUT**

Input the radius of the circle:2

The area of the circle with radius 2.0 is: 12.566370614359172

**11) Find biggest of 3 numbers entered**

**PROGRAM**

#find biggest of 3 numbers entered

a =int(input("Enter first number:"))

b =int(input("Enter second number:"))

c =int(input("Enter third number:"))

big = max(a,b,c)

print("Biggest of", a, b, c, "is", big)

**OUTPUT**

Enter first number:23

Enter second number:19

Enter third number:82

Biggest of 23 19 82 is 82

**12)Accept a file name from user and print extension of that**

**PROGRAM**

filename=input("Input the filename:")

f\_extns=filename.split(".")

print("The extension of the file is:",f\_extns[-1])

**OUTPUT**

Input the filename:python file

The extension of the file is: python file

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

**PROGRAM**

color=input("Enter colors(input some comma separated colors):")

color\_list=color.split(",")

print(color\_list)

print("The first color in the list is:",color\_list[0],"and the last color in the list is:",color\_list[-1])

**OUTPUT**

Enter colors(input some comma separated colors):black,blue,red

['black', 'blue', 'red']

The first color in the list is: black and the last color in the list is: red

**14)Accept an integer and compute n+nn+nnn.**

**PROGRAM**

a=int(input("Input an integer:"))

n1=int("%s"%a)

n2=int("%s%s"%(a,a))

n3=int("%s%s%s"%(a,a,a))

print(n1," ",n2," ",n3)

print("Sum=",(n1+n2+n3))

**OUTPUT**

Input an integer:27

27 2727 272727

Sum= 27 54 81

**15)Print out all colors from color-list not contained in color-list 2.**

**PROGRAM**

color\_list\_1 = set(["White", "Black", "Red"])

color\_list\_2 = set(["Red", "Green"])

print(color\_list\_1.difference(color\_list\_2))

**OUTPUT**

{'White', 'Black'}

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

**PROGRAM**

str1 = input("enter a first string:")

str2 = input("enter a second string:")

new\_a = str2[:1] + str1[1:]

new\_b = str1[:1] + str2[1:]

print("the new string after swapping first two character of both strings :",(new\_a+' '+new\_b))

**OUTPUT**

Enter a first string:arya

Enter a second string:pradeep

The new string after swapping first two character of both strings : prya aradeep

**17) Sort dictionary in ascending and descending order**

**PROGRAM**

d = {1:2, 3:4, 4:3, 2:1, 0:0}

print('original dictonary : ' ,d)

sorted\_d = sorted(d.items())

print('dictionary in ascending order by value : ',sorted\_d)

sorted\_d = sorted(d.items(),reverse=True)

print('dictionary in descending order by value : ',sorted\_d)

**OUTPUT**

original dictonary : {1: 2, 3: 4, 4: 3, 2: 1, 0: 0}

dictionary in ascending order by value : [(0, 0), (1, 2), (2, 1), (3, 4), (4, 3)]

dictionary in descending order by value : [(4, 3), (3, 4), (2, 1), (1, 2), (0, 0)]

**18) Merge two dictionary**

**PROGRAM**

d1 = {'a' : 100, 'b' : 200}

d2 = {'x' : 300, 'y' : 200}

print("dictionary 1=:" ,d1)

print("dictionary 2=:" ,d2)

d = d1.copy()

d.update(d2)

print("merged dictionary:" ,d)

**OUTPUT**

dictionary 1=: {'a': 100, 'b': 200}

dictionary 2=: {'x': 300, 'y': 200}

merged dictionary: {'a': 100, 'b': 200, 'x': 300, 'y': 200}

**19) Find gcd of two numbers.**

**PROGRAM**

#GCD of two numbers

a =int(input("Enter the first number:"))

b =int(input("Enter the second number:"))

for i in range (1, min(a,b)+1):

if (a%i==0 and b%i==0): gcd=i

print("gcd=",gcd)

**OUTPUT**

Enter the first number:26

Enter the second number:20

gcd= 2

**20)From a list of integers , create a list removing even numbers.**

**PROGRAM**

#Print number after removing even number

num1= input("Enter an integer list(space separted):")

num=list(map(int,num1.split()))

num=[x for x in num if x%2!=0]

print("List after removing even number",end="")

print(num)

**OUTPUT**

Enter an integer list(space separted):2 4 5 6

List after removing even number[5]

**COURSE OUTCOME 2**

**1)Program to find the factorial of a number**

**PROGRAM**

#Factorial of a number

a=int(input("Enter a number: "))

fact=1

for i in range(1,a+1):

fact=fact\*i;

print("Factorial of",a,"is",fact)

**OUTPUT**

Enter a number: 4

Factorial of 4 is 1

Factorial of 4 is 2

Factorial of 4 is 6

Factorial of 4 is 24

**2)Generate Fibonacci series of N terms**

**PROGRAM**

# Fibanocci series of first N numbers

n=int(input("Enter the number of terms:"))

f1,f2=0,1

f3=f1+f2

print("Fibanocci series of first",n,"terms")

print(f1)

print(f2)

for i in range (3, n+1):

print(f3)

f1=f2

f2=f3

f3=f1+f2

**OUTPUT**

Enter the number of terms:5

Fibanocci series of first 5 terms

0

1

1

2

3

**3)Find the sum of all items in a list**

**PROGRAM**

#sum of all elements in a list

list=input("Enter a list:")

list1=map(int,list.split())

sum=0

for i in list1:sum+=i

print("The sum of all items in list",list,"is",sum)

**OUTPUT**

Enter a list: 2 3 4

The sum of all items in list 2 3 4 is 9

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

**PROGRAM**

#four digit perfect square with even digits

import math

for i in range(1000,10000):

num=int(math.sqrt(i))

if num\*num==i:

n=i

while n!=0:

r=n%10

n=n//10

if r%2!=0:break

else:print(i)

**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**

#Program for pyramid.

n=int(input("Enter the step size:"))

for i in range(1,n+1):

k=i

for j in range(1,i+1):

print(k,end=' ')

k+=i

print()

**OUTPUT**

Enter the step size:4

1

2 4

3 6 9

4 8 12 16

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

**PROGRAM**

dict={}

str1= input("Enter a string:")

for n in str1:

if n in dict:

dict[n]+=1

else:

dict[n]=1

print("Character frequency")

for k,v in dict.items():

print(k,v)

**OUTPUT**

Enter a string:arya pradeep

Character frequency

a 3

r 2

y 1

1

p 2

d 1

e 2

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

**PROGRAM**

def add\_string(str1):

length = len(str1)

if length > 2:

if str1[-3:] == 'ing':

str1 += 'ly'

else:

str1 += 'ing'

return str1

print(add\_string('ab'))

print(add\_string('abc'))

print(add\_string('string'))

**OUTPUT**

ab

abcing

stringly

**8)Accept a list of words and return length of longest word.**

**PROGRAM**

def longestLength(a):

max1 = len(a[0])

temp = a[0]

# for loop to traverse the list

for i in a:

if(len(i) > max1):

max1 = len(i)

temp = i

print("The word with the longest length is:", temp,

" and length is ", max1)

# Driver Program

a = ["one", "two", "third", "four"]

longestLength(a)

**OUTPUT**

The word with the longest length is: third and length is 5

**9)Construct following pattern using nested loop.**

**\***

**\*\***

**\*\*\***

**\*\*\*\***

**\*\*\*\*\***

**\*\*\*\***

**\*\*\***

**\*\***

**\***

**PROGRAM**

#Pattern using Nested Loop.

n=5

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**

**\***

**\*\***

**\*\*\***

**\*\*\*\***

**\*\*\*\*\***

**\*\*\*\***

**\*\*\***

**\*\***

**\***

**10) Generate all factors of a number.**

**PROGRAM**

**# Python Program to find the factors of a number**

# This function computes the factor of the argument passed

def print\_factors(x):

print("The factors of",x,"are:")

for i in range(1, x + 1):

if x % i == 0:

print(i)

num = 200

print\_factors(num)

**OUTPUT**

The factors of 200 are:

1

2

4

5

8

10

20

25

40

50

100

200

**11)Write lambda functions to find area of square, rectangle and triangle.**

**PROGRAM**

import math

s\_area= lambda a : a\*\*2

r\_area = lambda len, ht : len\*ht

t\_area = lambda b,h : (1/2)\*b\*h

print("Area of Square (10) is:", s\_area(10))

print("Area of Rectangle (30,20) is:", r\_area(30,20))

print("Area of Triangle (10,20) is:", t\_area(10,20))

**OUTPUT**

Area of Square (10) is: 100

Area of Rectangle (30,20) is: 600

Area of Triangle (10,20) is: 100.0

**COURSE OUTCOME 3**

**1)Work with built in packages**

**2) 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 figure by different importing statement.(Include selective import of modules and import \* statement)**

**PROGRAM**

**Package: Graphics**

**Circle:**

#circle area

def CArea(r):

result=3.14\*r\*r

return result

#circle perimeter

def CPerimetr(r):

result=2\*3.14\*r

return result

**Rectangle**:

#area of rectangle

def Recarea(w,l):

result=w\*l

return result

#perimeter of rectangle

def Rperimeter(w,l):

result=2\*(l+w)

return result

**Sub-package: 3D Graphics**

**Cuboid:**

#area of cuboid

def Acuboid(a):

result=6\*a\*a

return result

#perimeter of cuboid

def Pcuboid(l,b,h):

result=4\*(l+b+h)

return result

**Sphere:**

#area and perimeter of sphere fun

def Asphere(r):

result=4\*3.14\*r\*r

return result

#perimeter fun

def Psphere(r):

result=(4/3)\*3.14\*r\*r\*r

return result

**Graphics Main.py**

from graphics.rectangleAPFunction import\*

from graphics.CircleAPFunction import\*

from graphics.dgraphics.cuboidAPFunction import\*

from graphics.dgraphics.sphereAPFun import\*

num1=int(input("enter length of rectangle"))

num2=int(input("enter breadth of a rectangle"))

print("area = ",Recarea(num1,num2))

print("perimeter =",Rperimeter(num1,num2))

radius=int(input("enter the radius of a circle"))

print("Circle area =",CArea(radius))

print("Circle perimeter =", CPerimetr(radius))

radius=int(input("enter radius of Sphere"))

print("area of sphere =",Asphere(radius))

print("perimeter of sphere =",Psphere(radius))

edge=int(input("enter the edge of cuboid"))

l=int(input("enter the length of cuboid"))

b=int(input("enter the breadth of cuboid"))

h=int(input("enter the heigtht of cuboid"))

print("area of cuboid",Acuboid(edge))

print("perimeter of cuboid",Pcuboid(l,b,h))

**OUTPUT**

enter length of rectangle 5

enter breadth of a rectangle 2

area = 10

perimeter = 14

enter the radius of a circle 6

Circle area = 113.03999999999999

Circle perimeter = 37.68

enter radius of Sphere 7

area of sphere = 615.44

perimeter of sphere = 1436.0266666666666

enter the edge of cuboid 9

enter the length of cuboid 9

enter the breadth of cuboid 6

enter the heigth of cuboid 4

area of cuboid 486

perimeter of cuboid 76

**COURSE OUTCOME 4**

**1.Create rectangle class with attributes length and breadth and method to find area and perimeter. Compare two rectangle objects by their area**

2**)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.**

**PROGRAM**

class bank():

def \_\_init\_\_(self,acnt,nam,typ,amt):

self.ac=acnt

self.name=nam

self.type=typ

self.amount=amt

def printamt(self):

print("Account Name",self.name)

print("Account Number=",self.ac)

print("Account Type=",self.type)

print("bal=",self.amount)

def with1(self,w1):

return(self.amount-w1)

n=input("Enter Name ")

t=input("Enter Type")

a=int(input("Enter Number:"))

am=int(input("Enter Amount:"))

obj=bank(a,n,t,am)

print("Account Details")

obj.printamt()

w=int(input("Enter amount to withdraw"))

print("b1=",obj.with1(w))

#print()

**OUTPUT**

Enter Name manu

Enter Type save

Enter Number:101

Enter Amount:10000

Account Details

Account Name manu

Account Number= 101

Account Type= save

bal= 10000

Enter amount to withdraw 1000

b1= 9000

**3) Create a class Rectangle with private attributes length and width .Overload ‘<’operator to compare the area of 2 rectangles.**