**1.Work with built-in packages**

Math

import math as m

print(m.pi)

print(".....................\n")

from math import pi,sqrt

print("Value of pi is ",pi)

print("Value of square root is ",sqrt(9))

print(".....................\n")

from math import sin,cos,tan

print("Value of sin(90) is ",sin(90))

print("Value of cos(90) is ",cos(90))

print(math.cos(90))

print("Value of tan(90) is ",tan(90))

print(".....................\n")

output

3.141592653589793

.....................

3.141592653589793

.....................

Value of pi is 3.141592653589793

Value of square root is 3.0

.....................

Value of sin(90) is 0.8939966636005579

Value of cos(90) is -0.4480736161291701

-0.4480736161291701

Value of tan(90) is -1.995200412208242

Module time

import time

print("Current time in second : ",time.time())

print("Current time : ",time.ctime())

print("Current time after 30 seconds : ",time.ctime(time.time()+30))

t=time.localtime()

print("time:",t)

print("current year:",t.tm\_year)

print("current month:",t.tm\_mon)

print("current day:",t.tm\_mday)

print("current week day:",t.tm\_wday)

print("current Hour:",t.tm\_hour)

print("current Minute:",t.tm\_min)

print("current Second:",t.tm\_sec)

output

Current time in second : 1643471006.6571994

Current time : Sat Jan 29 21:13:26 2022

Current time after 30 seconds : Sat Jan 29 21:13:56 2022

time: time.struct\_time(tm\_year=2022, tm\_mon=1, tm\_mday=29, tm\_hour=21, tm\_min=13, tm\_sec=26, tm\_wday=5, tm\_yday=29, tm\_isdst=0)

current year: 2022

current month: 1

current day: 29

current week day: 5

current Hour: 21

current Minute: 13

current Second: 26

Calendar

import calendar

mm = int(input("Enter month: "))

yy = int(input("Enter year :"))

print(calendar.month(yy,mm))

print(calendar.calendar(2015))

Output

Enter month: 2

Enter year :2000

February 2000

Mo Tu We Th Fr Sa Su

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

2015

January February March

Mo Tu We Th Fr Sa Su Mo Tu We Th Fr Sa Su Mo Tu We Th Fr Sa Su

1 2 3 4 1 1

5 6 7 8 9 10 11 2 3 4 5 6 7 8 2 3 4 5 6 7 8

12 13 14 15 16 17 18 9 10 11 12 13 14 15 9 10 11 12 13 14 15

19 20 21 22 23 24 25 16 17 18 19 20 21 22 16 17 18 19 20 21 22

26 27 28 29 30 31 23 24 25 26 27 28 23 24 25 26 27 28 29

30 31

April May June

Mo Tu We Th Fr Sa Su Mo Tu We Th Fr Sa Su Mo Tu We Th Fr Sa Su

1 2 3 4 5 1 2 3 1 2 3 4 5 6 7

6 7 8 9 10 11 12 4 5 6 7 8 9 10 8 9 10 11 12 13 14

13 14 15 16 17 18 19 11 12 13 14 15 16 17 15 16 17 18 19 20 21

20 21 22 23 24 25 26 18 19 20 21 22 23 24 22 23 24 25 26 27 28

27 28 29 30 25 26 27 28 29 30 31 29 30

July August September

Mo Tu We Th Fr Sa Su Mo Tu We Th Fr Sa Su Mo Tu We Th Fr Sa Su

1 2 3 4 5 1 2 1 2 3 4 5 6

6 7 8 9 10 11 12 3 4 5 6 7 8 9 7 8 9 10 11 12 13

13 14 15 16 17 18 19 10 11 12 13 14 15 16 14 15 16 17 18 19 20

20 21 22 23 24 25 26 17 18 19 20 21 22 23 21 22 23 24 25 26 27

27 28 29 30 31 24 25 26 27 28 29 30 28 29 30

31

October November December

Mo Tu We Th Fr Sa Su Mo Tu We Th Fr Sa Su Mo Tu We Th Fr Sa Su

1 2 3 4 1 1 2 3 4 5 6

5 6 7 8 9 10 11 2 3 4 5 6 7 8 7 8 9 10 11 12 13

12 13 14 15 16 17 18 9 10 11 12 13 14 15 14 15 16 17 18 19 20

19 20 21 22 23 24 25 16 17 18 19 20 21 22 21 22 23 24 25 26 27

26 27 28 29 30 31 23 24 25 26 27 28 29 28 29 30 31

30

Datetime

import datetime

t=datetime.time(22,56,44)

print(t)

print("hour",t.hour)

print("minute",t.minute)

print("second",t.second)

print("microsecond",t.microsecond)

import datetime

t=datetime.time(22,56,44) #time class

print(t)

print("Hour :",t.hour)

print("Minute :",t.minute)

print("Second :",t.second)

print("Microsecond :",t.microsecond)

print("......................................\n")

d=datetime.date.today()

print(d)

print("Year",d.year)

print("Month",d.month)

print("Day",d.day)

print("......................................\n")

d1=datetime.date.today()

print(d1)

td=datetime.timedelta(days=2)

print(td)

d2=d1+td

print(d2)

print("......................................\n")

dt=datetime.datetime.combine(d,t)

print(dt)

Output

22:56:44

hour 22

minute 56

second 44

microsecond 0

22:56:44

Hour : 22

Minute : 56

Second : 44

Microsecond : 0

......................................

2022-01-29

Year 2022

Month 1

Day 29

......................................

2022-01-29

2 days, 0:00:00

2022-01-31

......................................

2022-01-29 22:56:44

Random

import random

mylist = ["apple", "banana", "cherry"]

print(random.choice(mylist))

print(random.choices(mylist, k=2))

print(random.sample(mylist, k=2))

random.shuffle(mylist)

print(mylist)

print(random.randrange(3, 9))

**Output**

banana

['banana', 'apple']

['cherry', 'apple']

['cherry', 'banana', 'apple']

3

Statistics

import statistics

l1=[1,2,3,4,5]

print(statistics.mean(l1))

print(statistics.mean([1, 3, 5, 7, 9, 11])) #mean

# Calculate harmonic mean

print(statistics.harmonic\_mean([40, 60, 80]))

print(statistics.harmonic\_mean([10, 30, 50, 70, 90]))

**Output**

3

6

55.38461538461538

27.97513321492007

**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 figures by different importing statements. (Include selective import of modules and import \* statements)**

Circle

pi=3.14

def area(r):

print(pi\*r\*r)

def perimeter(r):

print(2\*pi\*r)

Rectangle

def area(a,b):

print (a\*b)

def perimeter(a,b):

print (2\*(a+b))

Cuboid

def perimeter(l,b,h):

print ("Perimeter : ",4\*(l+b+h))

def area(l,b,h):

print ("Area : ",2\*l\*b+2\*l\*h+2\*h\*b)

Sphere

def volume(r):

print ("Volume : ",(4/3)\*3.14\*r\*r\*r)

def area(r):

print ("Surface Area : ",4\*3.14\*r\*r)

Graphicsuse

from graphics import circle

from graphics import rectangle

from graphics.ThreeDgraphics import cuboid

from graphics.ThreeDgraphics import sphere

r=int(input("enter the radius"))

circle.area(r)

circle.perimeter(r)

a=int(input("enter a"))

b=int(input("enter b"))

rectangle.area(a,b)

rectangle.perimeter(a,b)

l=int(input("Enter the length,l : "))

b=int(input("Enter the breadth,b : "))

h=int(input("Enter the height,h : "))

cuboid.perimeter(l,b,h)

cuboid.area(l,b,h)

r=int(input("Enter the radius,r : "))

sphere.volume(r)

sphere.area(r)

**Output**

enter the radius3

28.259999999999998

18.84

enter a4

enter b5

20

18

Enter the length,l:4

Enter the breadth,b:5

Enter the height,h:6

Perimeter:60

Area:148

Enter the radius,r :5

Volume : 523.3333333333333334

Surface Area:314.0