1.Work with built-in packages

Math module

import math

print("The value of pi ",math.pi)

import math as m

print("The value of pi ",m.pi)

from math import pi,sqrt

print(math.pi)

print(math.sqrt(5))

print(math.tan(30))

print(math.cos(45))

output

The value of pi 3.141592653589793

The value of pi 3.141592653589793

3.141592653589793

2.23606797749979

-6.405331196646276

0.5253219888177297

Time Module

import time

print("current time in sec",time.time())

print("current time",time.ctime())

print("current time after 30 ",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 hour",t.tm\_hour)

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

print("day of year",t.tm\_yday)

output

current time in sec 1642524593.1554933

current time Tue Jan 18 22:19:53 2022

current time after 30 Tue Jan 18 22:20:23 2022

<module 'time' (built-in)> time.struct\_time(tm\_year=2022, tm\_mon=1, tm\_mday=18, tm\_hour=22, tm\_min=19, tm\_sec=53, tm\_wday=1, tm\_yday=18, tm\_isdst=0)

current year 2022

current month 1

current day 18

current hour 22

current week 1

day of year 18

Calendar module

import calendar

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

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

print(calendar.month(yy,mm))

print(calendar.calendar(2022))

output

Enter month8

Enter year2021

August 2021

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

30 31

2022

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

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

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

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

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

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 1 1 2 3 4 5

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

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

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

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

30 31

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 1 2 3 4 5 6 7 1 2 3 4

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

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

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

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

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 1 2 3 4 5 6 1 2 3 4

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

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

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

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

31

Date time module

import datetime

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

print(t)

print("hour",t.hour)

print("Minute",t.minute)

print("second",t.second)

print("Micro second",t.microsecond)

d=datetime.date.today()

print(d)

print("year",d.year)

print("month",d.month)

print("day",d.day)

d1=datetime.date.today()

print(d1)

td=datetime.timedelta(days=2)

print(td)

d2=d1+td

print(d2)

dt=datetime.datetime.combine(d1,t)

print(dt)

output

22:56:44

hour 22

Minute 56

second 44

Micro second 0

2022-01-18

year 2022

month 1

day 18

2022-01-18

2 days, 0:00:00

2022-01-20

2022-01-18 22:56:44

Statistics module

import statistics as s

print("harmonic\_mean",s.harmonic\_mean([20,30,40]))

print("mean",s.mean([9,10,24,35,36]))

print("median",s.median([9,10,24,35,36]))

print("mode",s.mode([9,10,24,35,36]))

print("variance ",s.variance([9,10,24,35,36]))

output

harmonic\_mean 27.69230769230769

mean 22.8

median 24

mode 9

variance 169.70000000000002

Random module

import random

random.seed(10)

print(random.random())

print(random.uniform(20, 60))

lst = ["orange", "apple", "graphes"]

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

print(random.random())

lst2 = ["orange", "apple", "graphes"]

random.shuffle(lst2)

print(lst2)

lst3 = ["orange", "apple", "graphes"]

print(random.choice(lst3))

output

0.5714025946899135

37.155562187004584

['graphes', 'orange']

0.20609823213950174

['orange', 'graphes', 'apple']

Graphes

**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)**

**Graphics**

**Circle**

def perimeter(r):

return(2\*3.14\*r)

def area(r):

return(3.14\*r\*r)

**Rectangle**

def perimeter(l,b):

return(2\*(l+b))

def area(l,b):

return(l\*b)

**Threedgraphics**

**Cuboid**

def perimeter(l,b,h):

return(4\*(l+b+h))

def area(l,w,h):

return(2\*l\*w+2\*l\*h+2\*h\*w)

**Sphere**

def perimeter(r):

return(2\*3.14\*r)

def area(r):

return(4\*3.14\*r\*r)

**Area**

from threedgraphics import cuboid

from threedgraphics import sphere

from graphics import rectangle

from graphics import circle

l=int(input("Enter length of cuboid:"))

w=int(input("Enter width of cuboid:"))

h=int(input("Enter height of cuboid:"))

b=int(input("Enter breadth of cuboid:"))

print("Area of cuboid=",cuboid.area(l,w,h))

print("perimeter of cuboid=",cuboid.perimeter(l,b,h))

r=int(input("Enter the radius of sphere:"))

print("Area of sphere=",sphere.area(r))

print("perimeter of sphere=",sphere.perimeter(r))

l=int(input("Enter length of rectangle:"))

b=int(input("Enter breadth of rectangle:"))

print("Area of rectangle=",rectangle.area(l,b))

print("Perimeter of rectangle=",rectangle.perimeter(l,b))

r=int(input("Enter radius of circle:"))

print("Area of Circle:",circle.area(r))

print("Perimeter of Circle:",circle.perimeter(r))

**Output**

Enter length of cuboid:5

Enter width of cuboid:4

Enter height of cuboid:3

Enter breadth of cuboid:7

Area of cuboid= 94

perimeter of cuboid= 60

Enter the radius of sphere:5

Area of sphere= 314.0

perimeter of sphere= 31.400000000000002

Enter length of rectangle:3

Enter breadth of rectangle:4

Area of rectangle= 12

Perimeter of rectangle= 14

Enter radius of circle:6

Area of Circle: 113.03999999999999

Perimeter of Circle: 37.68