**CO3 PROGRAMS**

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

**Solution:**

**Co3\_1**

1. **Module math**

***Input:***

import math

print(math.pi)

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

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

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

1. **Module time**

***Input:***

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 : 1643471707.1285696

Current time : Sat Jan 29 21:25:07 2022

Current time after 30 seconds : Sat Jan 29 21:25:37 2022

time: time.struct\_time(tm\_year=2022, tm\_mon=1, tm\_mday=29, tm\_hour=21, tm\_min=25, tm\_sec=7, 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: 25

current Second: 7

1. **Module calendar**

***Input:***

import calendar

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

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

print(calendar.month(yy,mm))

print(calendar.calendar(2015))

***output:***

Enter month: 5

Enter year :2000

May 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 30 31

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

1. **Module datetime**

***Input:***

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

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

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

1. **Module random**

***Input:***

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:***

cherry

['apple', 'cherry']

['banana', 'apple']

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

6

1. **Module statistics**

***Input:***

import statistics

print(statistics.mean([10,20,30,40,50,60]))

print(statistics.median([10,20,30]))

print(statistics.harmonic\_mean([10,20,30,40,50,60]))

out***put:***

35

20

24.489795918367346

**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)**

**Solution:**

***Package graphics***

1. **\_\_init\_\_.py**
2. **rectangle.py**

***Input:***

def perimeter(l,b):

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

def area(l,b):

print ("Area : ",l\*b)

1. **circle.py**

***Input:***

def perimeter(r):

print ("Perimeter : ",2\*3.14\*r)

def area(r):

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

***graphicsuse.py***

***Input:***

from graphics import rectangle

from graphics import circle

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

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

rectangle.perimeter(l,b)

rectangle.area(l,b)

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

circle.perimeter(r)

circle.area(r)

***output:***

Enter the length,l : 4

Enter the breadth,b : 2

Perimeter : 12

Area : 8

Enter the radius,r : 5

Perimeter : 31.400000000000002

Area : 78.5