COURSE OUTCOME 3

DATE: 13/11/2024

1. Work with built-in packages.

BUILT-IN PACKAGES IN PYTHON

Python comes with a comprehensive standard library that includes a wide range of built-in packages and modules. These modules provide functionality for tasks ranging from file I/O to web development. Here are some commonly used built-in packages in Python:

1. os :Operating system interface, provides a way of using operating system- dependent functionality like reading or writing to the file system
   import os

2. sys :Provides access to some variables used or maintained by the interpreter and to functions that interact strongly with the interpreter.
   import sys

3. math :Mathematical functions such as basic arithmetic operations, logarithms, trigonometric functions, etc.
   import math

4. datetime :Date and time handling.
   import datetime

5. json :JSON encoder and decoder.
   import json

6. urllib :URL handling modules, including parsing, quoting, and fetching.
   from urllib import request, parse

7. random :Generate pseudo-random numbers.
   import random

8. re :Regular expression operations.
   import re

9. collections :Implements specialized container datatypes.
   from collections import Counter, defaultdict

10. sqlite3 :SQLite database interface.
    import sqlite3

11. csv : CSV file reading and writing.
    import csv

12. gzip : Support for gzip files.
    import gzip

13. socket : Low-level networking interface.
    import socket

14. argparse : Command-line argument parsing.
    import argparse

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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)

PROGRAM

#home
-> main.py
-> graphics
-> rectangle.py
-> circle.py
-> threeD
-> cuboid.py
-> sphere.py

main.py #home

```
from graphics import rectangle,circle
from graphics.threeD import cuboid,sphere

#rectangle module
length=int(input("enter length of rectangle: "))
width=int(input("enter width of rectangle: "))
print("area of rectangle= ",rectangle.area(length,width))
print("perimeter of rectangle= ",rectangle.perimeter(length,width))
print()

#circle module
radius=int(input("enter radius of circle: "))
print("area of circle= ",circle.area(radius))
print("perimeter of circle= ",circle.perimeter(radius))
print()

#cuboid module
clength=int(input("enter length of cuboid: "))
cwidth=int(input("enter width of cuboid: "))
cheight=int(input("enter height of cuboid: "))
```

```
print("area of cuboid= ",cuboid.surfacearea(clength,cwidth,cheight))
print("volume of cuboid= ",cuboid.volume(clength,cwidth,cheight))
print()

#sphere module
sradius=int(input("enter radius of sphere: "))
print("area of sphere= ",sphere.surfacearea(sradius))
print("volume of sphere= ",sphere.volume(sradius))
```

graphics

rectangle.py #home/graphics/rectangle.py

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

circle.py #home/graphics/circle.py

```
import math
def area(radius):
  return math.pi*radius**2
def perimeter(radius):
  return 2*math.pi*radius
```

threeD

cuboid.py #home/graphics/threeD/cuboid.py

```
def surfacearea(length,width,height):
  return 2*((length*width)+(width*height)+(height*length))
def volume(length,width,height):
  return length*width*height
```

sphere.py #home/graphics/threeD/sphere.py

```
import math
def surfacearea(radius):
  return 4*math.pi*radius**2
def volume(radius):
  return (4/3)*math.pi*radius**3
```

OUTPUT

```
enter length of rectangle: 4
enter width of rectangle: 5
area of rectangle=  20
perimeter of rectangle=  18

enter radius of circle: 5
area of circle=  78.53981633974483
perimeter of circle=  31.41592653589793
enter length of cuboid: 4
enter width of cuboid: 5
enter height of cuboid: 7
area of cuboid=  166
volume of cuboid=  140

enter radius of sphere: 5
area of sphere=  314.1592653589793
volume of sphere=  523.5987755982989



enter length of rectangle: 6
enter width of rectangle: 8
area of rectangle=  48
perimeter of rectangle=  28

enter radius of circle: 7
area of circle=  153.93804002589985
perimeter of circle=  43.982297150257104

enter length of cuboid: 4
enter width of cuboid: 2
enter height of cuboid: 3
area of cuboid=  52
volume of cuboid=  24

enter radius of sphere: 6
area of sphere=  452.3893421169302
volume of sphere=  904.7786842338603
```