



***INTRODUCTION
TO
PYTHON MODULES***

PYTHON LIBRARIES

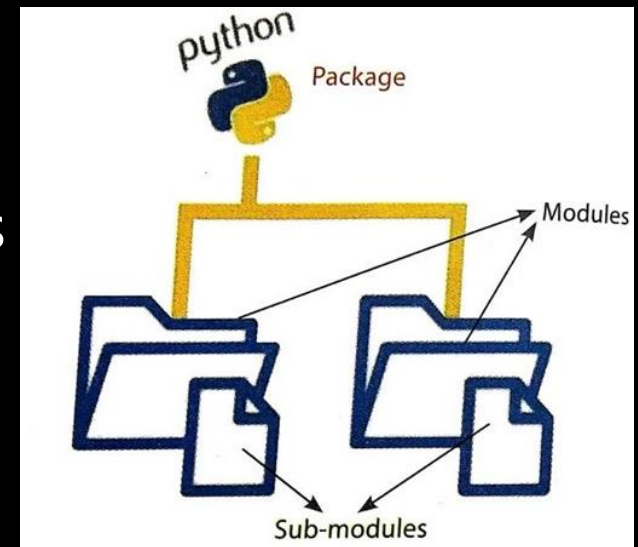
- Frequently used modules are generally known as libraries which contain code for general purpose.
- These libraries are the collection of methods, classes which can be used easily.
- Python program is made using 3 different components. -
 - Library or package
 - Module
 - Functions/sub-modules

RELATION BETWEEN PYTHON LIBRARIES, MODULE AND PACKAGE

A **module** is a file containing python definition, functions, variables, classes and statements. The extension of this file is ".py".

A **python** package, directory(folder) is of python modules.

A **library** is collection of many packages in python. Generally there is no difference between python package and python library.



MODULE IN PYTHON

- A **module** is a file containing python definition, functions, variables, classes and statements. The extension of this file is ".py".
- They are of two types: build-in module and user defined module
- A user can directly import the libraries and its modules using **import** keyword or can create their own modules.
- **Advantages of modules**–
 - Its biggest advantage is that we can import its functionality in any program and use it.
 - Reusability is one of the biggest advantages.
 - It helps in logically organization of Python code.
 - Programming becomes very easy when we use the collection of same types of codes.
 - Categorization : same attributes can be stored in one module.

IMPORTING MODULES

There are three different ways to import the modules in our python programs:

- 1) By using “import” statement to import a module.

```
Import <module name>
```

- 2) By using “from” statement.

```
from <module name> import function_name
```

- 3) By using “import *” statement.

```
from < module_name> import *
```

BUILD-IN MODULES

1. Math module:

Calling functions within interactive mode:

```
>>>math.floor(-45.17)
```

```
>>>math.sqrt(25)
```

calling functions within script mode:

```
import math
```

```
math.sqrt(25)
```

2. Random module: used to generate random numbers.

```
import random
```

random.randrange(3,30, 3) // generates an integer between its lower and upper arguments.

```
random.random()// generates a random number from 0 to 1
```

```
random.randint() // generates a random number between two given numbers.
```

```
Words=['Computer' , 'Science', 'Informatics']
```

```
A= random.choice(Words)
```

BUILD-IN MODULES

Statistics Module: implements many common statistical formulas for efficient calculations.

Mean() : calculates the arithmetic mean of the number in a list.

Median(): returns the middle value of numeric data in a list.

Mode(): returns the most repeated value of the list/ sequence passed.

```
import statistics
```

```
statistics.mode(("red", "blue", "red", "yellow"))
```

```
statistics.median([1,2,3,4,5])
```

CREATING MODULE

- To create a module just save the code you want in a file with the file extension .py:

```
shape.py - C:/Users/KVBBKServer/
File Edit Format Run Options Window Help
# This is a module named shape

def AreaCircle(r):
    return 3.14*r*r

def AreaRectangle(a,b):
    return a*b

def AreaCylinder(r,h):
    return 3.14*r*r*h
```

Shape.py is a module

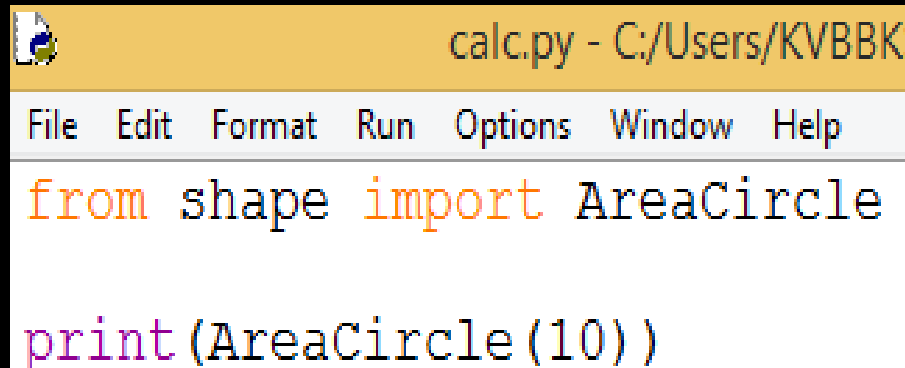
```
*calc.py - C:/Users/KVBBKServer/
File Edit Format Run Options Window Help
import shape

print(shape.AreaCircle(10))
print(shape.AreaRectangle(10,20))
print(shape.AreaCylinder(10,7))
```

We used module in our program by using import keyword. And (.) is used for accessing particular member of the module.

ACCESSING SINGLE FUNCTION FROM MODULES

- Syntax: Using from <module> import <function_name>



```
calc.py - C:/Users/KVBBK
File Edit Format Run Options Window Help
from shape import AreaCircle
print(AreaCircle(10))
```

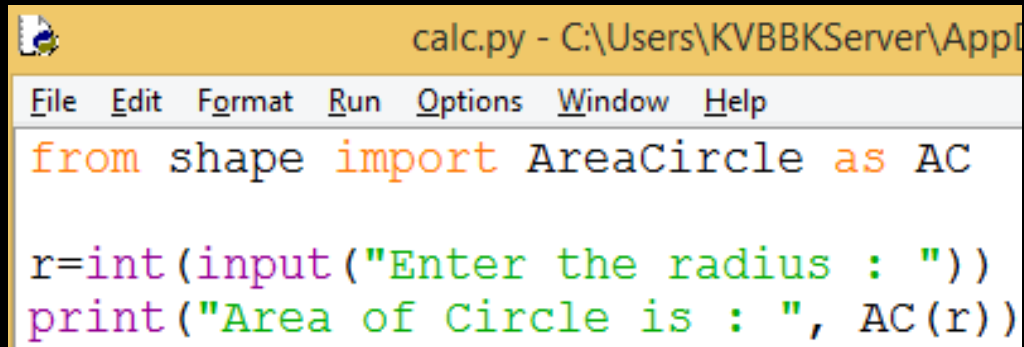
- Here we want to calculate only area of the circle so we imported only AreaCircle function from previously created module shape.py
- **Note:** When importing using the from keyword, do not use the module name when referring to elements in the module.
Example: **AreaCircle(10), not shape.AreaCircle(10)**

MODULE ALIASING IN PYTHON

You can create an alias when you import a module, by using the as keyword:

import <ModuleName> as <AliaName>

Then we use (.) operator to use the members of the module with alia name of module. Example is given below -



```
calc.py - C:\Users\KVBBKServer\AppData\Local\Microsoft\Windows\Apps\PythonSoftwareFoundation.Python.3.9.0.0_qbk9qtczc6p30csobw61qbxwv0q3t\python.exe
File Edit Format Run Options Window Help
from shape import AreaCircle as AC

r=int(input("Enter the radius : "))
print("Area of Circle is : ", AC(r))
```