New syllabus 2022-23

Chapter 4

Python Libraries

Computer Science

Class XII (As per CBSE Board)

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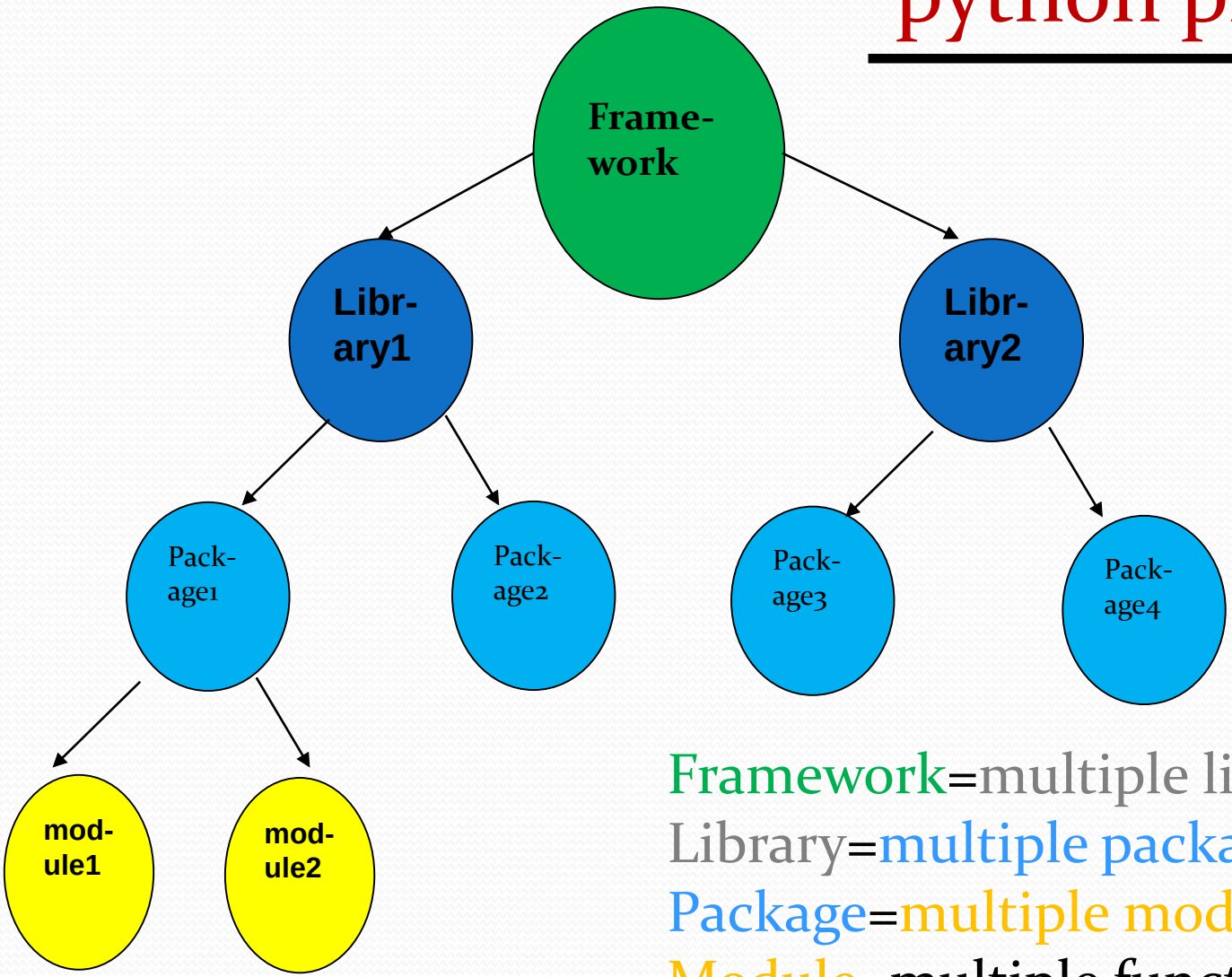
Modularization of python program



Framework=multiple library
Library=multiple packages
Package=multiple module
Module=multiple function/class

Using Python Libraries

Following terms must be clear while developing any python project/program.

1. Module
2. Package
3. Library
4. Framework

1. Using Module -It is a file which contains python functions/global variables/clases etc. It is just .py file which has python executable code / statement.For example: Let's create a file usermodule.py

```
def hello_message(user_name):
    return "Hello " + name
```

Now we can import usermodule.py module either in python interpreter or other py file.

```
import usermodule
print usermodule.hello_message("India")
```

Using Python Libraries

How to import modules in Python?

Python module can be accessed in any of following way.

1. Python import statement

```
import math
print("2 to the power 3 is ", math.pow(2,3))
```

Just similar to math ,user defined module can be accessed using import statement

2. Import with renaming

```
import math as mt
print("2 to the power 3 is ", mt.pow(2,3))
```

3. Python from...import statement

```
from math import pow
print("2 to the power 3 is ", pow(2,3))
```

4. Import all names

```
from math import *
print("2 to the power 3 is ", pow(2,3))
```

Using Python Libraries

2. Using Package - It is namespace that contains multiple package or modules. It is a directory which contains a special file __ init __.py

Let's create a directory geometry. Now this package contains multiple packages / modules to handle user related requests.

```
geometry/ # top level package
        __ init __.py

        rectangle/ # first subpackage
                __ init __.py
                area_rect.py
                perimeter_rect.py
        circle/ # second subpackage
                __ init __.py
                area_circ.py
                perimeter_circ.py
```

Now we can import it in following way in other .py file

```
from geometry.rectangle import area_rect
from geometry.circle import perimeter_circ
```

Using Python Libraries

3. Using Library

It is a collection of various packages. Conceptually,There is no difference between package and python library.In Python, a library is used loosely to describe a collection of the core modules.

'standard library' of Python language comes bundled with the core Python distribution are collection of exact syntax, token and semantics of the Python language . The python standard library lists down approx more than 200 such core modules that form the core of Python.

"Additional libraries" refer to those optional components that are commonly included in Python distributions.

The Python installers automatically adds the standard library and some additional libraries.

The additional library is generally provided as a collection of packages. To use such additional library we have to use packaging tools like easyinstall or pip to install such additional libraries.

Using Python Libraries

3. Create library – create following directory and files structure to learn library creation & use

C:/mylib/Library1(dir)----------|

| |package1(dir.)------ |module1.py functions1/classs1

| | |module2.py functions2/classs2

| |

| |package2(dir.)------ |module3.p functions3/classs3

|__init__.py(blank file) |module4.py functions4/classs4

|mylibcall.py

```
from library1.package1 import module2
print(module2.moduletest2())
```

```
def moduletest2():
    print("from module2")
```

Define a function moduletest2() in module2.py file and call this function in mylibcall.py file as a part of library1 library.Now run mylibcall.py file

It will call moduletest2() method and display-'from module2' message.

Please make sure that a blank file with __init__.py is created.

Set as environment variable of library1 to call any where(path) on the system

Using Python Libraries

4. Using Framework

Framework is like a collection of various libraries which architects some more component.

For e.g. Django which has various in-built libraries like Auth, user, database connector etc.