**Que 1 : Introduction to Python modules and importing modules.**

**What is a Module in Python?**

A **module** is a **Python file** (.py) that contains **definitions of functions, variables, classes, or runnable code** that you can reuse in other Python programs.

Think of a module as a **toolbox**. Instead of writing code again and again, you just **import the toolbox** and use the tools.

**Why Use Modules?**

* To **reuse code** (don't repeat yourself)
* To **organize code better**
* To use **built-in functionalities** (like math, random, datetime, etc.)
* To use **third-party libraries** (like NumPy, Pandas, Matplotlib, etc.)

**Types of Modules**

1. **Built-in Modules** – already available in Python  
   (e.g., math, random, datetime)
2. **User-defined Modules** – created by you (your own .py files)
3. **Third-party Modules** – installed using pip  
   (e.g., numpy, pandas, flask)

**Importing Modules in Python**

**Basic Import:**

import math

print(math.sqrt(16)) # Output: 4.0

**Import with Alias (short name):**

import math as m

print(m.pi) # Output: 3.141592653589793

**Import Specific Functions:**

from math import sqrt, pi

print(sqrt(25)) # Output: 5.0

print(pi) # Output: 3.141592653589793

**Import Everything (not recommended):**

from math import \*

print(sin(0))

**User-defined Module Example**

**Step 1: Create a file mymodule.py**

# mymodule.py

def greet(name):

return "Hello, " + name

**Step 2: Use it in another file**

# main.py

import mymodule

print(mymodule.greet("Krishna"))

**Que 2 : Standard library modules: math, random.**

**1. math Module**

The math module provides mathematical functions like square root, trigonometry, factorial, etc.

Example:

import math

print(math.sqrt(16)) # Square root → 4.0

print(math.factorial(5)) # Factorial → 120

print(math.pi) # Value of π → 3.141592653589793

print(math.sin(0)) # sin(0 radians) → 0.0

**2. random Module**

The random module is used to generate random numbers or make random selections.

Example :

import random

print(random.randint(1, 10)) # Random integer between 1 and 10

print(random.random()) # Random float between 0.0 and 1.0

print(random.choice(['A', 'B', 'C'])) # Randomly pick one item

print(random.shuffle([1, 2, 3, 4])) # Shuffle a list (changes in-place)

**Que 3 : Creating custom modules.**

**Creating Custom Modules in Python**

In Python, you can create your **own module** (also called a **user-defined module**) to organize and reuse your code. A module is simply a **Python file** (.py) containing functions, variables, or classes.

**Step 1: Create the Module**

Create a Python file named mymodule.py with some functions inside:

Ex : # mymodule.py

def greet(name):

return "Hello, " + name

def square(x):

return x \* x

**Step 2: Use the Module in Another File**

Now create another Python file (e.g., main.py) in the same folder and import your module:

Ex : # main.py

import mymodule

print(mymodule.greet("Krishna")) # Output: Hello, Krishna

print(mymodule.square(5)) # Output: 25

**Import Specific Functions**

You can also import specific functions:

Ex : from mymodule import greet

print(greet("Neha"))

**Why Use Custom Modules?**

Code reusability

Better organization

Makes large programs easier to manage