Modules in Python

What is a Module?

- A **module** is a file containing Python code (functions, variables, classes).
- Purpose → Code reuse and better organization.
- Instead of writing long programs in one file, we split into small modules.

Types of Modules:

1. **Built-in Modules** → Already provided with Python.

   Examples: math, random, datetime, os.

2. **User-defined (Custom) Modules** → Made by programmer.

Using Built-in Modules:

```
import math
print(math.sqrt(16))   # 4.0
print(math.pi)         # 3.14159

import random
print(random.randint(1, 10))  # Random number between 1 and 10
```

Importing Specific Functions:

```
from math import sqrt, pi
print(sqrt(25))   # 5.0
print(pi)         # 3.14159
```

Creating a Custom Module:

File: mymodule.py

```python
def greet(name):
    return f"Hello, {name}!"
def add(a, b):
    return a + b
```

Main File:

```python
import mymodule
print(mymodule.greet("Ali"))   # Hello, Ali!print(mymodule.add(5, 3))
# 8
```

Renaming a Module (alias)

```python
import math as m
print(m.sqrt(36))   # 6.0
```

Importance of Modules:

- Reusability
- Organization
- Productivity