Python Notes – Day 4

✓ 1. What is a Function in Python?

A **function** is a **block of reusable code** that performs a specific task when called. It helps make the code **cleaner**, **modular**, and **less repetitive**.

Why Use Functions?

- Breaks complex programs into smaller parts
- Avoids repeating code
- Easier to test and debug
- Improves readability

Function Structure:

```
def function_name(parameters):
    # function body
    return result
```

Example:

```
def greet(name):
    print("Hello,", name)

greet("Devu")
```

✓ 2. Types of Functions in Python

Type	Description	Example
Built-in Functions	Predefined in Python	print(), len(), input()
User-defined Functions	Defined by the programmer using def	def greet():
Lambda Functions	Anonymous functions using lambda	lambda x: x*x

Example of Each Type

User-defined Function:

```
def add(a, b):
    return a + b

print(add(5, 3))
```

Lambda Function:

```
square = lambda x: x * x
print(square(4))  # Output: 16
```

✓ 3. What is a Module in Python?

A **module** is a Python file (.py) that contains **functions, classes, or variables** you can reuse in other files.

Example:

Let's say you have a file named calculator.py:

```
def add(x, y):
    return x + y
```

Now you can import and use it:

```
import calculator
print(calculator.add(2, 3))  # Output: 5
```

✓ 4. What is a Library in Python?

A **library** is a **collection of modules**. It offers tools and functions so you don't have to write everything from scratch.

Examples of Popular Libraries:

Library	Use Case
NumPy	Numeric calculations, arrays
Pandas	Data analysis
Matplotlib	Data visualization
Requests	Making HTTP requests
Django	Web development

✓ 5. How to Import Modules in Python?

You can **import** a module in different ways:

A. Full Module Import

```
import math
print(math.sqrt(16))
```

B. Import Specific Function

```
from math import sqrt
print(sqrt(25))
```

C. Import with Alias

```
import math as m
print(m.sqrt(36))
```

✓ 6. Built-in Modules in Python

These come pre-installed with Python and don't require installation.

Module	Purpose
math	Mathematical functions
random	Random number generation
datetime	Date and time manipulation
os	Interact with the operating system
sys	System-specific parameters

Example – Random Module:

```
import random
print(random.randint(1, 100))  # Output: Any number between 1 and 100
```

✓ 7. How to Install External Modules in Python?

Some modules are **not built-in** and must be installed using **pip**.

What is pip?

pip is the **package installer for Python**. It is used to install external libraries.

How to Use pip:

```
pip install module_name
```

Example:

```
pip install numpy
pip install pandas
```

✓ After installing, you can use them in your Python script:

```
import numpy as np
print(np.array([1, 2, 3]))
```

✓ Summary:

- ✔ What functions are, and how to create and use them
- ✔ Difference between built-in, user-defined, and lambda functions
- ✔ What modules and libraries are in Python
- ✔ How to import and use both built-in and external modules
- ✔ How to install third-party libraries using pip
- ✔ Practice writing and importing your own module