# Module 13  Python Fundamentals

Introduction to **Python Theory:**

## 1. Introduction to Python and its Features (simple, high-level, interpreted language).

**Python** is high-level, object oriented programming and an interpreted language. It's designed with readability and simplicity in mind, making it one of the most popular languages for beginners and experienced developers alike.

**Python Features:**

➡ **High-level Programming language**

Python abstracts low-level operations like memory management, so developers can focus on writing efficient and readable code, rather than managing complex memory allocation or pointers.

➡ **Interpreted Language**

Python is an interpreted language, which means the code is executed line-by-line by the interpreter without needing a compilation step.

➡ **Portable**

Python is interpreted, you don't need to compile it specifically for each platform. You can run the same Python script on multiple systems as long as Python is installed.

➡ **Object-Oriented Programming (OOP)**

Python fully supports object-oriented programming, which allows you to create classes and objects . OOP helps in organizing code into modules that can be easily reused and extended.

## 2. History and evolution of Python.

**Guido Van Rossum,** a Dutch programmer, is the creator of Python. In December **1989**,

 **1980s**: Guido van Rossum, a Dutch programmer, was working at the Centrum Wiskunde & Informatica (CWI) in the Netherlands.

He was using the ABC language, which influenced many of Python's core principles.

 **1989**: During a Christmas vacation, Guido began working on a new scripting language that would be a descendant of ABC but more flexible and extensible.

**Python First Version Released On**

20-February 1991 ( Python :- version 0.9.0)

- Python 1.x (1991–2000)
- Python 2.x (2000–2010)
- Python 3.x (2008–present)

## 3. Advantages of using Python over other programming languages.

**Python** is a flexible and high-level programming language that is easy to use. It has many features that make it better than other languages, which is why both beginners and experts like to use it.

1) Easy to Learn and Use

- Python has a simple and clean syntax, which makes it easy to learn and understand, even for beginners.

2) Interprented & Dynamically Typed

- Python is interpreted, meaning code executes line-by-line, making debugging easier.

3) Large Standard Library

- Python has a large set of built-in libraries (like math, datetime, file handling, web requests, etc.).
  You can do a lot of tasks without needing to install extra tools.

4) Object-Oriented Programming (OOP)

- Python fully supports object-oriented programming, which allows you to create classes and objects . OOP helps in organizing code into modules that can be easily reused and extended.

## 4. Installing Python and setting up the development environment (Anaconda, PyCharm, or VS Code)

Installing Python

1) Go to the official website: https://www.python.org

2) Click on Downloads and choose your operating system (Windows, macOS, Linux).

3) Download the latest version (e.g., Python 3.12).

5) Run the installer:

After installation, open a terminal or command prompt and type:

python –version

If it shows the version, Python is installed correctly.

## • Setting Up with Anaconda (For Data Science & ML)

Steps:

1. Go to https://www.anaconda.com
2. Download the Anaconda installer for your OS.
3. Install it using default settings.
4. Open **Anaconda Navigator** – a GUI to launch tools like:
   - Jupyter Notebook

## • Setting Up with PyCharm (Python IDE)

Steps:

1. Download PyCharm from https://www.jetbrains.com/pycharm
2. Choose the Community version.
3. Install it using default options.
4. Open PyCharm and create a new project.
5. It will detect Python automatically or ask you to choose a Python interpreter.

- **Setting Up with Visual Studio Code (VS Code)**

Steps :

1. Go to the official website https://code.visualstudio.com
2. Click on Downloads and choose your operating system (Windows, macOS, Linux).
3. Open VS Code and go to Extensions.
4. Search for and install Python extension by Microsoft.
5. After installing, open a .py file or create one.

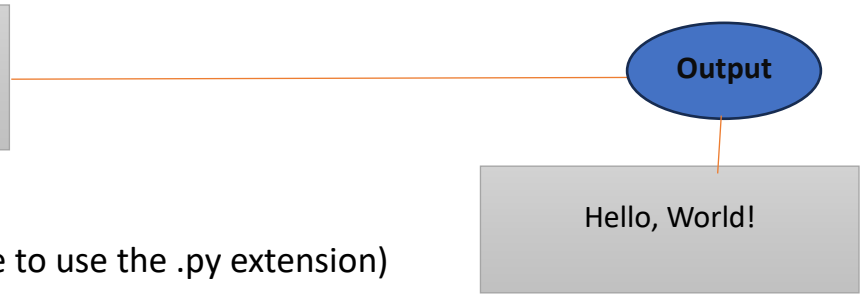
## 5 Writing and executing your first Python program.

Open code editor VS Code.

And Write Code:

```
# This is my first Program

print("Hello, World!")
```




Save the file as hello.py (make sure to use the .py extension)