



PYTHON LIFE

Python Intro

Python is a high-level, interpreted programming language known for its simplicity, readability, and versatility. It was created by Guido van Rossum and first released in 1991.

What is Python?

Python is an interpreted, object-oriented, high level programming language.

What is Programming?

Programming is the process of creating a set of instructions that tell a computer how to perform a task.

Programming can be done using a variety of computer programming-languages such as JavaScript, Python, and C++

What is Coding?

Coding is a list of step by step instructions that get computers to do what you want them to do.

Coding makes it possible for us to create computer software, games, apps and websites.

High-level language:

A high-level language is a programming language that is designed to be easy to read and write for humans. It typically provides more abstraction from the hardware and is closer to human language, making it easier to understand and write complex programs.

Examples of high-level languages: Python, Java, JavaScript, Ruby, Swift, PHP, etc.

```
num1 = 5
num2 = 7
result = num1 + num2
print("Result:", result)
```

Low-level language:

A low-level language is a programming language that provides little to no abstraction from the hardware. These languages are closer to machine code and are often used for system-level programming and optimization.

Examples of low-level languages: Assembly language, machine code.

compiler:

A compiler is a software tool that translates high-level programming code into machine code (binary code) that a computer's processor can understand and execute directly.

Interpreter

An interpreter reads the source code line by line, translates each line into machine code or byte code, and executes it immediately. It does not produce an intermediate executable but directly executes the code at runtime.

Python: Compiler or Interpreter?

Python is **both** a compiled and an interpreted language.

Compilation to Bytecode:

- When you run a Python program, the Python interpreter first **compiles** the source code (`.py`) into an intermediate form called **bytecode** (`.pyc` files).
- This step is automatic and not visible to the user.
- **Interpretation:**
 - The Python Virtual Machine (**PVM**) takes this bytecode and **interprets** it line by line to execute the program.

Python is often referred to as an interpreted language because:

- You do not see the compilation step explicitly.
- The execution happens in real-time using the Python Virtual Machine.

Python Modules

A module is **a function or group of similar functions**. They are grouped together within a file and contain the code to execute a specific task when called into a larger application. You create modules to better organize and structure your codebase.

Python Library

A library is a collection of pre-written code that you can use to perform specific tasks. Libraries are often used to reduce the amount of code a programmer needs to write by providing reusable functions or classes that can be called upon as needed.

Python Syntax compared to other programming languages

Python Installation

Python

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

Java

```
public class HelloWorld {  
    public static void main(String[] args) {  
        System.out.println("Hello, World!");  
    }  
}
```

C++

```
#include <iostream>  
  
int main() {  
    std::cout << "Hello, World!" << std::endl;
```

```
    return 0;  
}
```

C

```
#include <stdio.h>  
  
int main() {  
    printf("Hello, World!\n");  
    return 0;  
}
```