



جامعة المستقبل  
AL MUSTAQBAL UNIVERSITY

# كلية العلوم قسم الانظمة الطبية الذكية

## Lecture: (1)

**Introduction - Software Development**

**Subject: Object oriented programming II**

**Class: Second**

**Lecturer: Dr. Maytham N. Meqdad**





## Introduction to Python

**Python** is a high-level language programming, interpreted, interactive and object-oriented scripting language. Python is designed to be highly readable. It uses English keywords frequently where as other languages use punctuation, and it has fewer syntactical constructions than other languages. Python is named after a TV Show called 'Monty Python's Flying Circus' and not after Python-the snake.

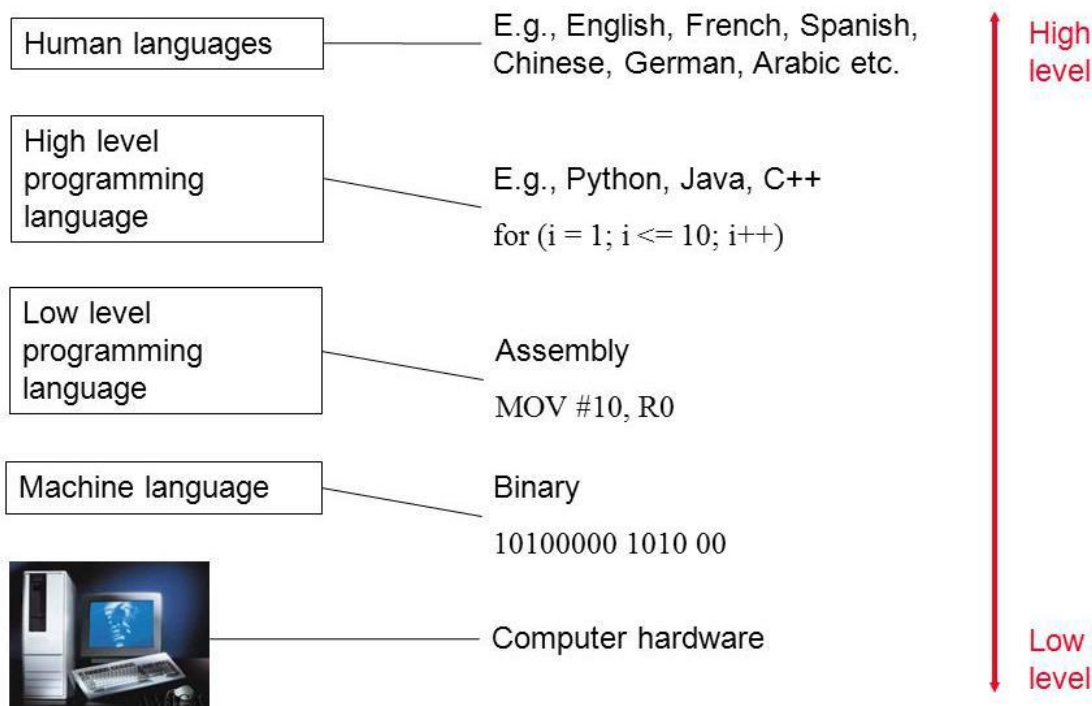


Figure1.1. High and Low Level Language

**Python is interpreted:** Python is processed at runtime by the interpreter. You do not need to compile your program before executing it. This is similar to PERL and PHP.

- An interpreter is a program that reads in as input a source program, along with data for the program, and translates the source program instruction by instruction. For example, the Java interpreter java translates a .class file into code that can be executed natively on the underlying machine.



- A compiler is a special program that processes statements written in a particular programming language and turns them into machine language or "code" that a computer's processor uses. Typically, a programmer writes language statements in a language such as Pascal or C one line at a time using an editor.
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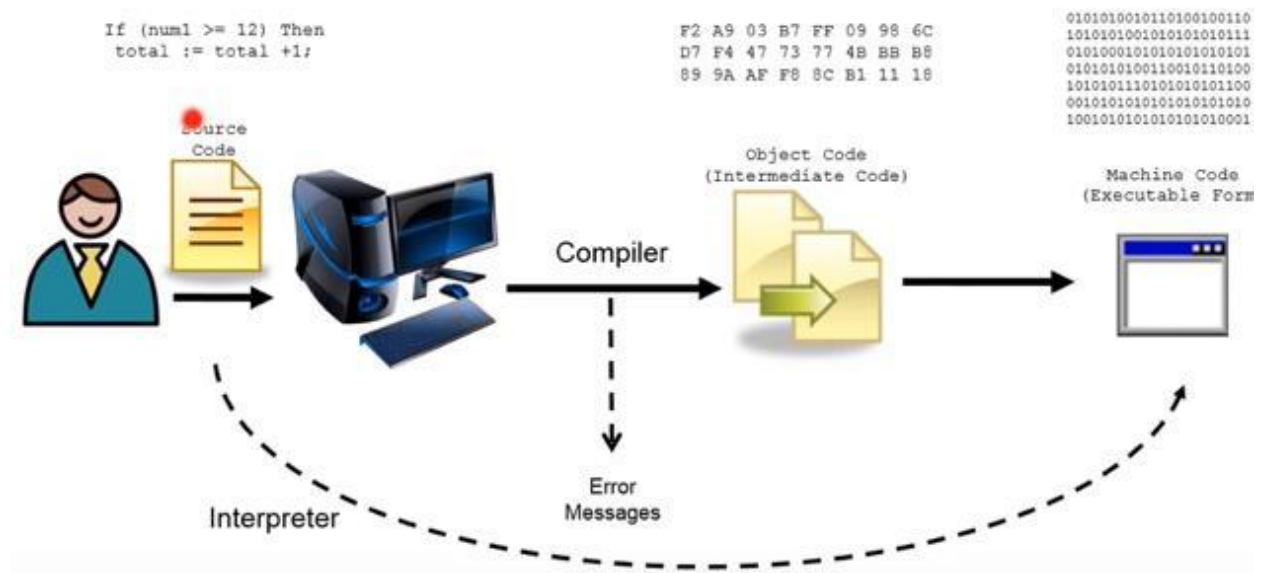
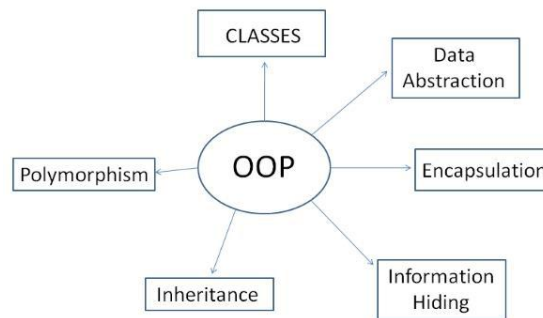


Figure 2.1. Interpreter and Compiler

- **Python is Interactive:** You can actually sit at a Python prompt and interact with the interpreter directly to write your programs.
- **Python is Object-Oriented:** Python supports Object-Oriented style or technique of programming that encapsulates code within objects.

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**Object-oriented programming (OOP)** is a programming language model organized around objects rather than "actions" and data rather than logic. Historically, a program has been viewed as a logical procedure that takes input data, processes it, and produces output data. The object-oriented programming capabilities of the MATLAB® language enable you to develop complex technical computing applications faster than with other languages, such as C++, C#, Python, PHP and Java.



**Figure 3.1. OOP features**

**History of Python:** Python was developed by Guido van Rossum in the late eighties and early nineties at the National Research Institute for Mathematics and Computer Science in the Netherlands.



Python is derived from many other languages, including ABC, Modula-3, C, C++, Algol-68, SmallTalk, and Unix shell and other scripting languages.

Python is copyrighted. Like Perl, Python source code is now available under the GNU General Public License (GPL).

Python is now maintained by a core development team at the institute, although Guido van Rossum still holds a vital role in directing its progress.

Python 1.0 was released in November 1994. In 2000, Python 2.0 was released. Python 2.7.11 is the latest edition of Python 2.

Meanwhile, Python 3.0 was released in 2008. Python 3 is not backward compatible with Python 2. The emphasis in Python 3 had been on the removal of duplicate programming constructs and modules so that "There should be one -- and preferably only one -- obvious way to do it." Python 3.5.1 is the latest version of Python 3



### **Python's features include:**

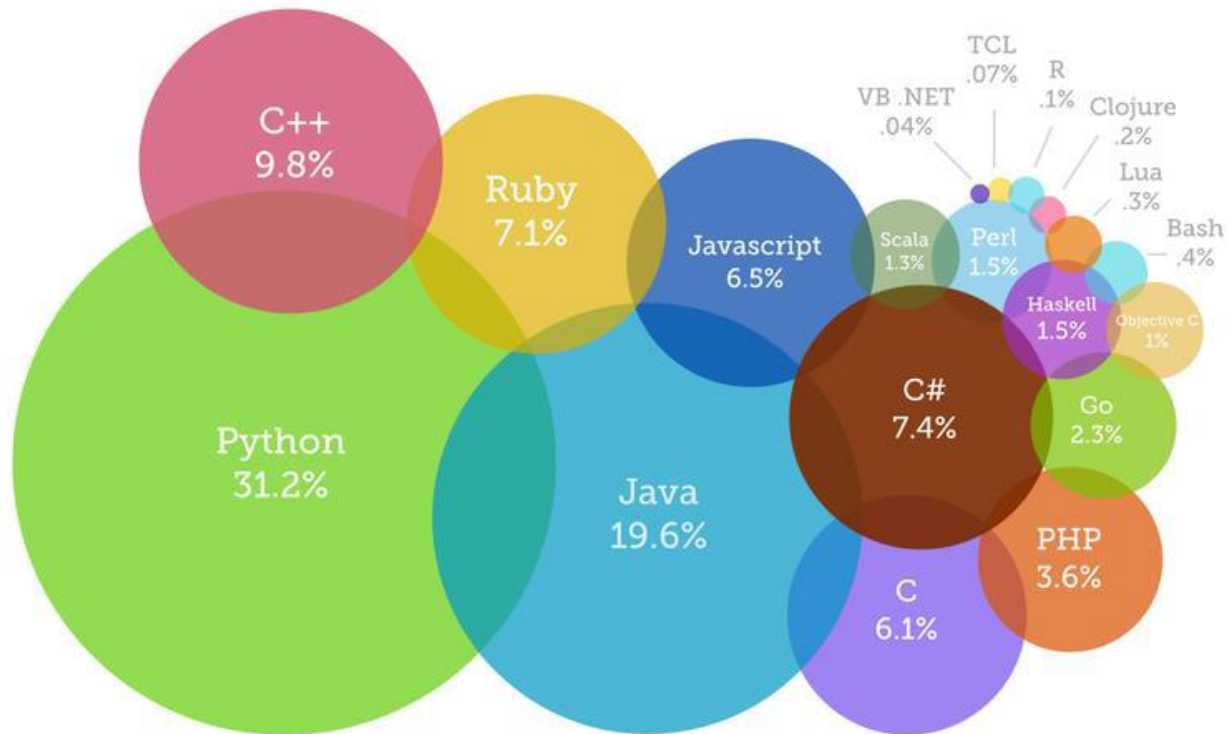
- **Easy-to-learn:** Python has few keywords, simple structure, and a clearly defined syntax. This allows the student to pick up the language quickly.
- **Easy-to-read:** Python code is more clearly defined and visible to the eyes.
- **Easy-to-maintain:** Python's source code is fairly easy-to-maintain.
- **A broad standard library:** Python's bulk of the library is very portable and cross-platform compatible on UNIX, Windows, and Macintosh.
- **Interactive Mode:** Python has support for an interactive mode which allows interactive testing and debugging of snippets of code.
- **Portable:** Python can run on a wide variety of hardware platforms and has the same interface on all platforms.
- **Extendable:** You can add low-level modules to the Python interpreter. These modules enable programmers to add to or customize their tools to be more efficient.
- **Databases:** Python provides interfaces to all major commercial databases.
- **GUI Programming:** Python supports GUI applications that can be created and ported to many system calls, libraries and windows systems, such as Windows MFC, Macintosh, and the X Window system of Unix.
- **Scalable:** Python provides a better structure and support for large programs than shell scripting.

### **Implementations of Python**

- CPython
  - Main reference implementation
  - With large libraries written in C & Python
  - Support by almost every OS
- o Windows
  - o Linux
  - o Mac OS X
  - o Apple iOS
  - o Android



## Popular Coding Languages



**Figure 4.1. Popular Coding Languages**