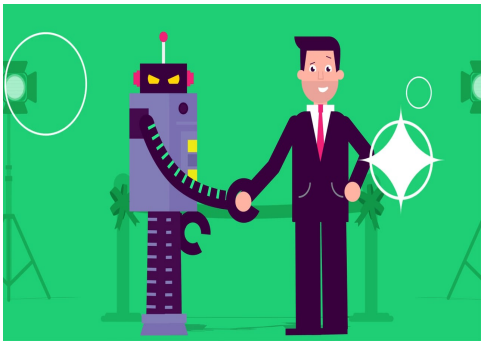
Welcome to Programming

In the world of programming, machines are going to be our best buddy. Our buddy can understand only 0s and 1s, which is called binary language.



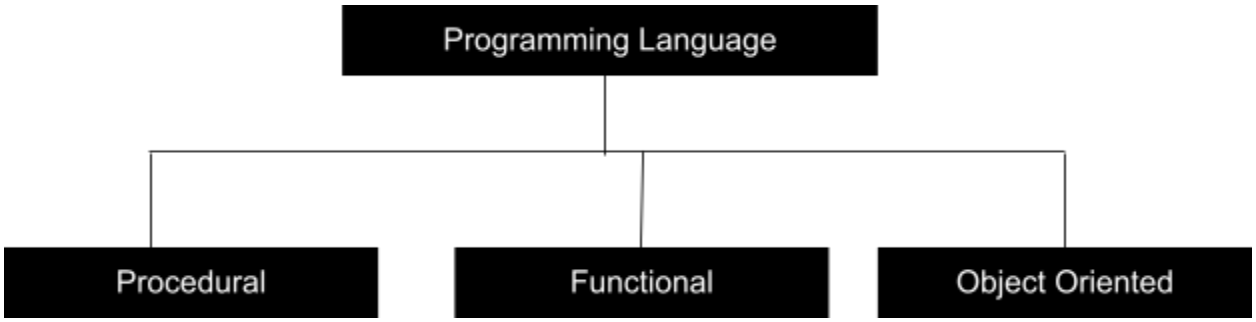
For humans it becomes a tedious task to communicate with machines/computers in binary language in order to make them do a task. To make this communication easier we write our tasks in a language understandable for humans and later that can be easily converted to machine understandable code. In simple terms this journey is called programming.

Now, let's see the formal definitions...

Programming: It is the process of creating a set of instructions that tell a machine how to perform a particular task.

Programming language: It is a computer language used by programmers to communicate with machines/computers.
Eg: C, C++, Java, Python

Types Of Programming Languages



1. **Procedural Programming Language:**
   - It follows a step-by-step approach to break down a task into a collection of well structured sequences of instructions, which are done in a systematic manner.
   - Example: FORTON, C, C++, Java, Python, etc

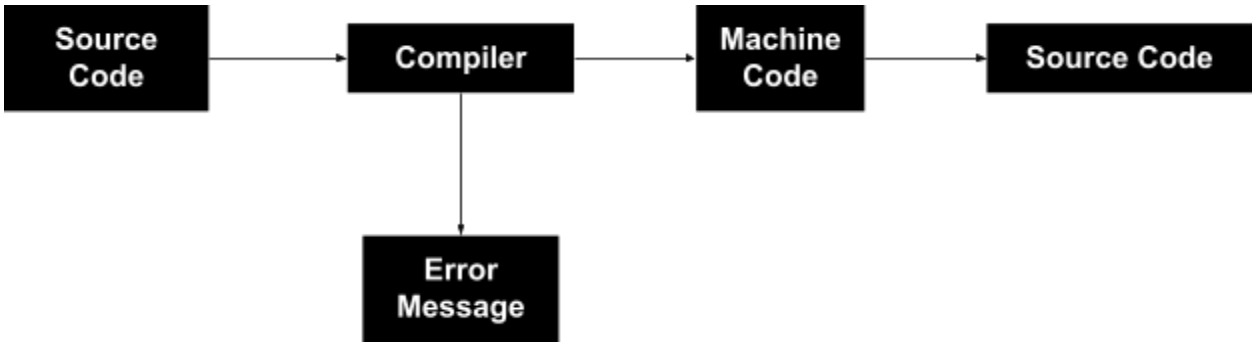
2. **Functional Programming Language:**
    - These are designed on the concept of mathematical functions that use conditional expressions and recursion to perform computation.
    - Functional programming supports higher-order functions and lazy evaluation features.
    - Eg: Lisp, Python, Erlang, etc

3. **Object Oriented Programming Language:**
    - It uses classes and objects to create models based on the real world environment.
    - Easy to maintain and modify existing code as new objects are created inheriting characteristics from existing ones.
    - Eg: Java, Python, C++, Lisp, Perl

Compiled VS Interpreted Languages

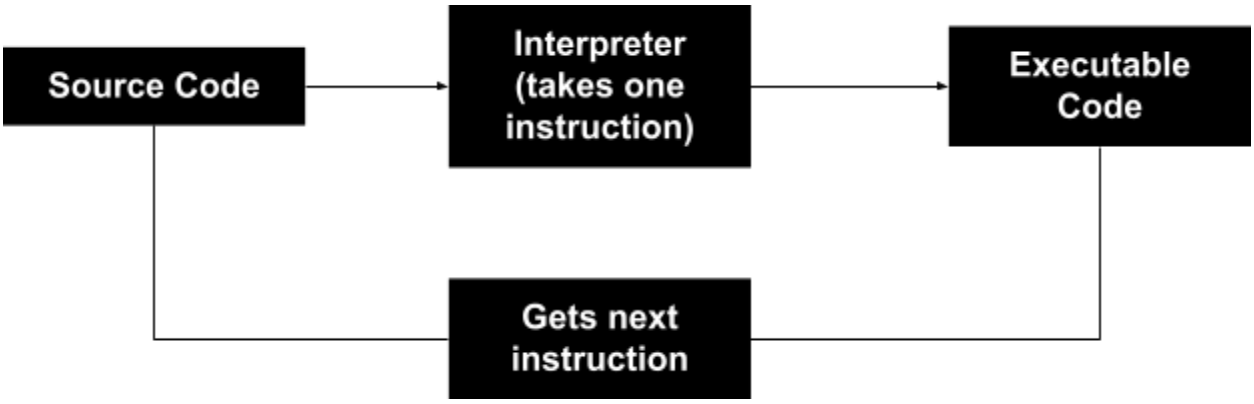
Compiled Languages:

- Compiled languages are converted directly into machine code that the processor can execute.
- They are faster and more efficient to execute.
- Eg: C, C++, C#, etc



Interpreted Languages:

- Interpreters run through a program line by line and execute each command.
- Can be modified while the program is running.
- Tend to be slower than compiled languages.
- Eg: PHP, Python



Static Language VS Dynamic Language

Static	Dynamic
Perform type checking at compile time	Perform type checking at runtime
Errors will show at compile time	Error might not show till programs run
Declare datatypes before use	No need to declare datatype of variables
More control	Saves time in writing code but might give error at runtime.

Static languages: C, C++, Java etc

Dynamic Languages: Python, Javascript