Difference Between Python and C Language

Key Difference - Python vs C Language

Programming languages allow humans to create a meaningful set of instructions for a computer to perform tasks. Python and C are two high-level programming languages. The **key difference** between Python and C is that **Python is a multi-paradigm language and C is a structured programming language.** This article discusses the main difference between Python and C.

What is Python?

Python is a high-level programming language created by Guido van Rossum. It is a multi-paradigm which mainly supports object-oriented programming, functional programming, and object-oriented programming. Object orientation capability of Python allows the programmer to use, create classes and to build objects using them. All real-world scenarios can be modeled to objects. Student, teacher, employee, book are examples of objects. Even a complex business process can be brought to the computing environment to develop software solutions using Python. Python also supports procedural programming. Procedural programming is derived from the structured programming which based on the concept of procedure calls.

Python is an interpreter based language. The interpreter reads each statement line by line. It is also interactive because the programmer can give commands using Python command line. As the code is read line by line, Python is slow in comparison to compiler languages. One major advantage of Python is the automatic garbage collector for garbage collection. It is easier for programmers to write efficient code rather than concentrating on memory management. Python is easy to use with databases such as MYSQL, SQLite and to create Graphical User Interfaces.
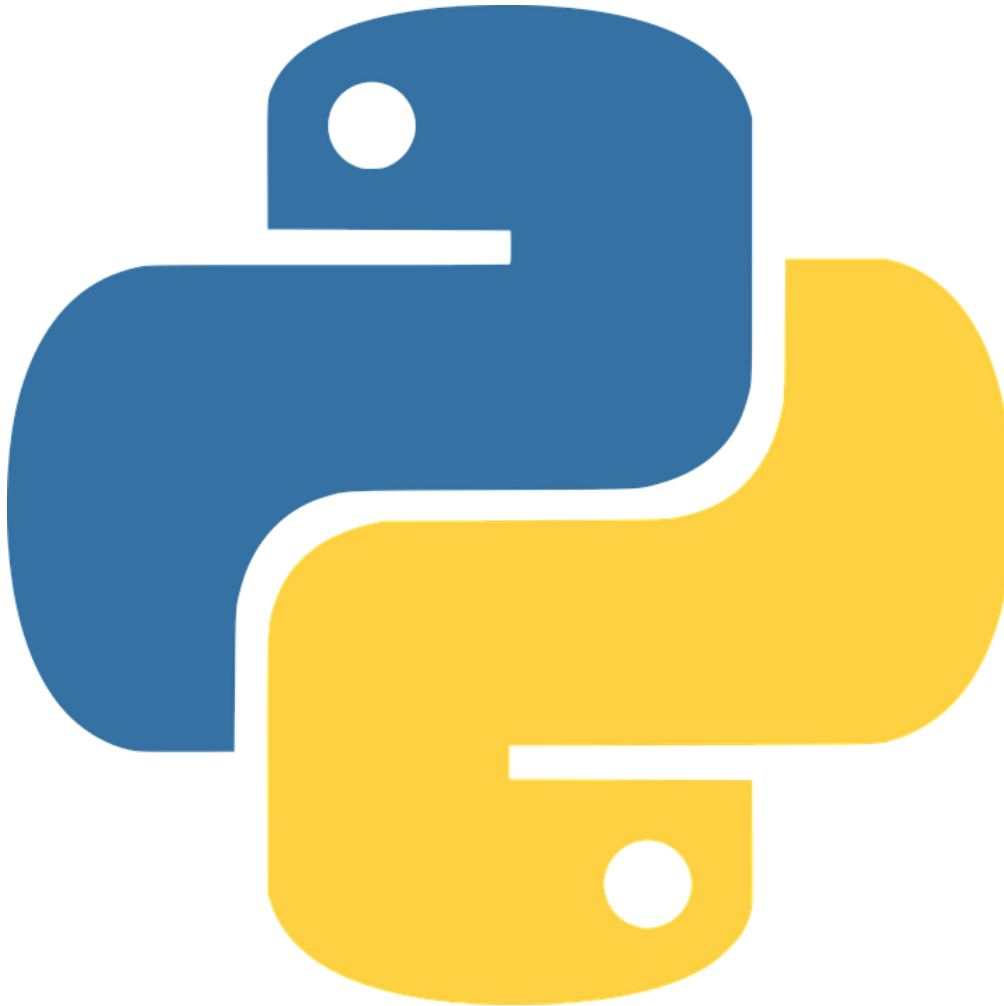
Figure 01: Python

Python is not strongly typed language which means it is not necessary to declare variable type. The programmer can directly write a statement, counter = ten without declaring type of the variable. Python automatically declares this counter variable as an integer. Python syntax is easy to learn, read and maintain. It is considered as a good language for a beginner to start programming.

What is C Language?

C is a high-level programing language found by Dennis Ritchie when developing the UNIX operating system. It is a foundation programming language for other programming languages such as Java, Python, JavaScript, etc. It is a structured programming language which allows using functions, selections (if/else, etc), iterations (loops).

C is a compiled programming language. The complete source code is converted into a machine language which is easier for a computer to understand. Therefore, it is a fast

language, and it is widely using for hardware-related applications such as operating systems and network drivers.
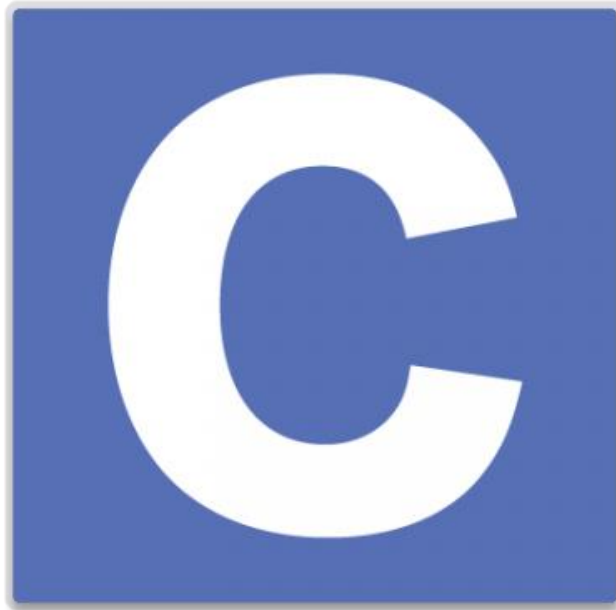

Figure 02: C Language

In C language, it is programmer's task to allocate memory on his own. C has functions such as calloc(), malloc() for dynamic memory allocation. Normally, once the program finishes execution, the operating system frees the allocated memory. It is a good C programming practice to use free() function to release the allocated memory.

C is a strongly typed language. Thus, declaring variables is compulsory. e.g., int counter = 10; float height = 5.3; C has basic data types (integers, floats) and derived data types like arrays, pointers, structures, unions, and enums.

What are the Similarities Between Python and C Language?

- Both are High-level programming languages.

- Both languages can be used to implement Multithreading.
- Both languages can be used for embedded systems programming.
- C is a foundation language for many languages including Python.

What is the Difference Between Python and C Language?

Python vs C Language	
Python is a multi-paradigm. It mainly supports Object-oriented programming, Procedural programming, Functional programming.	C is a Structured programming language.
Language Type	
Python is an interpreter based language. The interpreter reads the code line by line.	C is a compiled language. The complete source code is converted into machine language.
Memory Management	
Python use automatic garbage collector for memory management.	In C, Programmer has to do memory management on his own.
Applications	
Python is a General-Purpose programming language.	C is mainly used for hardware related applications.
Speed	
Python is slow.	C is fast.
Variable Declaration	
In Python, no need to declare variable type.	In C, it is compulsory to declare variable type.
Complexity	
Python programs are easier to learn, write and read.	C program syntax is harder than Python.
Testing and Debugging	
Testing and debugging is easier in Python.	Testing and debugging is harder in C.

Summary - Python vs C Language

Python and C languages are useful languages to develop various applications. The difference between Python and C is that Python is a multi-paradigm language and C is a structured programming language. Python is a general-purpose language which is used for machine learning, natural language processing, web development and many more. C is mainly using for hardware related application development such as operating systems, network drivers.

Reference:

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