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Sector

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Speciality

IT Analysis and Programming

Theme

Software Development Languages

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INTRODUCTION

A programming language is a set of symbols, grammars and rules with the help of which one is able to translate algorithms to programs that will be executed by the computer. The programmer communicates with a machine using programming languages. They are used to create tools like computer systems, complex programs, websites and even software for operating systems. Those used for software development are called software development languages and our presentation will focus on how they work.

What is a Software Development Language?

A lot of systems today have a mix of hardware and software that is tightly integrated, like modern smartphones, tablets, etc. The software part concerns all the applications with which a user of the system acts. Let us mention that a website is not a software. Although many software are used in the design and deployment of websites, website as an entity still can't be called a software due to its low complex functionality, interactivity, and lack of offline availability as opposed to the attributes of a software.

There are three basic types of software:

- **System software** to provide core functions such as operating systems, disk management, utilities, hardware management and other operational necessities.
- **Programming software** to give programmers tools such as text editors, compilers, linkers, debuggers and other tools to create code.
- **Application software** (applications or apps) to help users perform tasks.

So, we can define software development as the practice of organizing the design and the construction of software, in order to provide interaction between the machine and the user and to solve a problem of this user. And that's where software development languages come in.

Programming Languages used for software development may vary according to multiple factors. Some might pick the most secure one, some easiest or some pick the robust one.

How do these languages work?

Writing the software in the form of binary is impossible and that's why the engineers made various programming languages to do it.

Programming languages need to convert program into machine language so that the computer can understand it. There are two ways to do this:

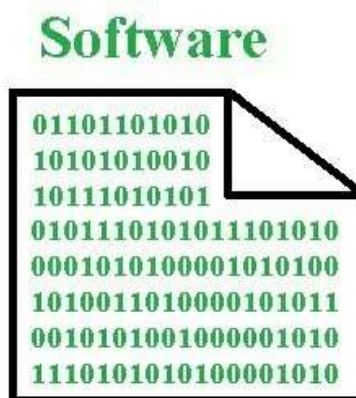
- Compile the program
- Interpret the program

Compile is to transform a program written in a high-level programming language from source code into object code. This can be done by using a tool called compiler. A compiler reads the whole source code and translates it into a complete machine code program to perform the required tasks which is output as a new file.

Interpret is to execute instructions written in a high-level language as they entered. An interpreter reads the source code one instruction or line at a time, converts this line into machine code and executes it.

Software development languages use the “compilation” because an output file is expected as the software. Sometimes two or more languages are used for making one particular software. Before understanding how this file is obtained, you must know that a software is a set of instructions instructing a computer to do specific tasks.

This set of instructions is also known as a program. These softwares which are running on the computer is in the form of binary code that is 1 and 0 which is an executable file as shown in the figure below.



Binary executable file

As every task in the computer is done with the help of these programs the developer can change it as he wants by doing a program that's why a computer is also called a programmable machine. Any program is written using any language that is understandable for a human is called source code and after writing it, this source code

with the help of the compiling process is converted into executable file. And for example, when we double click on an application in our computer, the computer executes the instructions of the file through the code obtained in machine language.

A software can be created in two different ways:

- **Proprietary:**
The software owned by a person or software company and sold to make money. The source code is not released to the public, only the software is released.
- **Open source:**
The software is free and anyone can access the source code. Open-source software owners get money through donations.

Popular software development languages

➤ Python

Python is a high-level programming language used for general-purpose programming. With a simple syntax, Python has automatic memory management and dynamic features that make it suitable to be used in a variety of applications in the software development companies such as gaming, web applications, language development, prototyping, etc. The testers use it, as debugging is quite easy in this language.

Advantages :

- Consist of third-party modules
- Object-oriented languages
- Portable across operating systems
- Contains user-friendly data structures
- Widely supported and has an active

➤ Java

Java is an object-oriented programming language that can be written on any device and can work even on a cross-platform basis. Often used to develop mobile applications, Java is also the basis of the Android operating system. The language is preferred by the testers owing to its ability to use even on cross-platforms.

Advantages :

- This language is platform-independent in both binary and source level
- User and design friendly ;
- Known for its feature of security and called as the safest programming language which can disrupt corruption or errors
- Has the added feature of Stack allocation system which helps in data storing and easy restoring;
- Java has the feature of automatic garbage collection and memory allocation

➤ C

One of the most difficult programming languages for software development, gaining an understanding and knowledge of C makes it simple to learn other languages such as C++. Since it is a machine-level language, a tester who has its knowledge does not find it difficult to test a program written in any other language as well.

Advantages :

It is known to be the building block of many other languages seen today

Consists of a lot a function that includes system-generated functions

It is portable and can be set-up fast

Has the capability to arrange the program in a clear, easy and logical way