Introduction to Programming Languages.

Ortiz Vega Angelo
Course Code: CE3104
Name: Languages, Compilers and interpreters.
Module: Languages.
Academic Area of Computer Engineering.
Cartago, Costa Rica.

-Keywords: Programming Languages, High-Level Programs, Programming Paradigm, FORTRAN, COBOL, ALGOL 60, PL1, PASCAL, C, C++, JAVA, LISP, PROLOG.

-Content:

The first high-level programming languages were designed during the 1950s. Since then, programming languages have been a fascinating and prolific area of study for computer scientists and engineers.

The study of programming languages is sometimes called programming linguistics, by analogy with the linguistics of natural languages. The analogy is based on the fact that both; Natural languages and programming languages have syntax (form) and semantics (meaning). The analogy cannot be taken in the whole context. Programming languages cannot be compared with natural languages in terms of their range of expressiveness and subjectivity. On the other hand, a natural language is nothing more or less than a group of people who speak and write, so natural linguistics is restricted to the analysis of existing languages; while programming languages are carefully designed and can be implemented in computers.

Every programming language must be: universal, natural and implementable.

Syntax vs Semantics:

The syntax of a programming language is related to the form of the programs, for example, such as expressions, commands, declarations, etc. They are put together in a program.

The semantics of a programming language is related to the meaning of the programs; for example, how they will behave when they run on a computer.

High level programs:

It is characterized by expressing the algorithm in a manner appropriate to human cognitive capacity, rather than the capacity that machines execute.

Programming Languages:

In computer science, a program for the construction of other computer programs is known as the programming language. Its name is due to the fact that it includes a formal language that is designed to organize algorithms and logical processes that will then be carried out by a computer or computer system, thus allowing to control its physical, logical behavior and its communication with the human user.

Common Programming Languages:

1. FORTRAN (Formula Translating System)
    a. Developer: IBM
    b. Paradigm: Multiparadigm: structured, imperative
2. COBOL (Common Business Oriented Language)
    a. Developer: CODASYL, ANSI, ISO.
    b. Paradigm: Procedural, Imperative, Object-Oriented.
3. ALGOL 60 (Algorithmic Language)
    a. Paradigm: Procedural, Imperative, Structured.
4. PL1 (Programming Language 1)
    a. Developer: IBM
    b. Paradigm: Procedural, Imperative, Structured.
5. PASCAL
    a. Developer: Niklaus Wirth.
    b. Paradigm: Imperative, Structured.
6. C
    a. Developer: Dennis Ritchie & Bell Labs.
    b. Paradigm: Imperative
7. C++
    a. Developer: Bjarne Stroustrup.
    b. Paradigm: Multiparadigm: procedural, functional, object-oriented.
8. JAVA
    a. Developer: Oracle Corporation.
    b. Paradigm: Object-Oriented
9. LISP
    a. Developer: Steve Rusell, Timothy P. Hart, Mike Levin.
    b. Paradigm: Multiparadigm: functional, procedural, reflective.
10. PROLOG (Programmation en logique francés)
    a. Developer: Alain Colmerauer, Robert Kowalski
    b. Paradigm: Logic Programming.

In the following table you can find the rank of programming languages until July 2019

Jul 2019	Jul 2018	Change	Programming Language	Ratings	Change
1	1		Java	15.058%	-1.08%
2	2		C	14.211%	-0.45%
3	4	^	Python	9.260%	+2.90%
4	3	v	C++	6.705%	-0.91%
5	6	^	C#	4.365%	+0.57%
6	5	v	Visual Basic .NET	4.208%	-0.04%
7	8	^	JavaScript	2.304%	-0.53%
8	7	v	PHP	2.167%	-0.67%
9	9		SQL	1.977%	-0.36%
10	10		Objective-C	1.686%	+0.23%
11	12	^	Ruby	1.636%	+0.43%
12	13	^	Assembly language	1.390%	+0.24%
13	11	v	Swift	1.121%	-0.29%
14	15	^	MATLAB	1.078%	-0.05%
15	81	^^	Groovy	1.070%	+0.96%
16	18	^	Go	1.016%	+0.05%
17	19	^	Visual Basic	1.009%	+0.12%
18	16	v	Delphi/Object Pascal	0.950%	-0.16%
19	17	v	Perl	0.918%	-0.18%
20	14	vv	R	0.837%	-0.31%

Conclusion:

The basic understanding of the concepts of programming languages and the different paradigms are necessary for all software engineers, not so much for specialists in a programming language. This is because programming languages are a fundamental tool.

Programming languages greatly influence the way we think about the design and construction of software and the algorithms and data structures we use to develop software.