



 Research Article

MODERN PROGRAMMING LANGUAGES: CLASSIFICATION AND CHARACTERIZATION

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ABSTRACT

In this article, the most common programming languages are considered, as well as their comparative analysis and the study of the prospects of their use in the future.

KEYWORDS

Python, C++, Java, programming, computer, code, syntax.

INTRODUCTION

Programming languages are the working tools for creating computer programs. Their development has been going on for about fifty years. Therefore, we will consider the programming languages that are popular among the most advanced programmers [1-5].

Python: A growing modern programming language. It has a relatively small number of simple commands, which undoubtedly makes its syntax one of the simplest among modern programming languages. Ease of learning and a large number of programming styles (including structured, functional, object-oriented, imperative, and aspect-oriented) are called

Python. Code written in Python by one programmer can be easily read by others, making it easier to work with code in the Python programming language [6-11].

Other advantages of Python:

- the ability to check for errors on separate sections of the program, not on the whole;
- flexible for almost all modern platforms;
- a large standard library;
- Compatible with all environments with languages such as C++ and C.
- Disadvantages of this language:
- the relatively low speed of algorithm execution, characteristic of many interpreted programming languages;
- problems with data types due to the use of dynamic typing when transferring files in large projects.

Python has become one of the leaders in the web application development segment, while constantly gaining new fans and strengthening its position among developers. The language has many applications adapted to solve different problems on any platform. Among them: PyPy, IronPython, Stackless, Jython, Unladen Swallow, Micro Python and others [9-14].

C++: Despite the fact that this programming language was created in the early eighties of the last century, it can be classified as modern, because it has not lost its popularity among programmers, but is used by high-level professionals. To date, C++ is the most widely used programming language (it can be said that it

is slowly losing its place in Java family languages), and learning it is the responsibility of any programmer. C++ is based on the compiled, statically typed C programming language, and as a result, suffers from some disadvantages:

- relatively clumsy syntax, which can result in errors that are harder to recognize and therefore eliminate. The clumsiness of the syntax, combined with the complex specification of the language, makes it difficult to learn;
- long program code, which leads to increased compilation time and difficulties in using programs.

The main advantages of C++ are:

- Easier handling by the C compiler, hence higher code compatibility. C++ code can be used in C with minimal changes, and vice versa;
- versatile. C-plus-plus is suitable for solving almost any programming task;
- cross-platform and low requirements for the computing power of computers;
- freedom for the programmer to choose different programming styles: structural, object-oriented, functional, and generative.

Language standards are updated from time to time. The last one was released in December 2021. C++ continues to evolve with new additions to the standard library to improve performance and improve performance. At the same time, the main rule of the language remains to maintain compatibility with the previous language - C. At

the same time, as the developers noted, writing code in C ++ is much easier.

Java: The Java programming language is designed for strongly typed and object-oriented programming. Java, like C++, is based on the core C language. The main feature of the language is the use of a virtual machine that processes the program code, regardless of the operating system and computer hardware. The advantages of this processing method include increased security, and the disadvantages include reduced performance, which is countered by improving bytecode handling methods.

Advantages of Java include:

- advanced standard libraries that do not require plugins;
- the high degree of portability of the program;
- the relative ease of reading;
- has built-in support for working on computer networks.
- Negative qualities include:
- strong load on the machine's RAM and, as a result, low speed and low performance;
- the language has been developing for a long time, so among the extensions and the main tools of the language, there are tools with completely the same functional value.

For the past few years, Java has been dominating the list of the best software for developers of all kinds. Therefore, the relevance of this language, founded in 1990, has not yet completely ended. Java is the leader among programming languages in the segment of mobile applications, and the

share of development in the job market for programmers is constantly increasing. Web projects also include a large number of languages belonging to the Java family.

CONCLUSION

In modern times, programmers are faced with several programming languages with different features. Their development does not stop, on the contrary, it only accelerates and is in the direction of increasing the types of languages. Therefore, it is becoming more and more difficult to choose a major, but at the same time, knowledge of the main and most common languages discussed in this article is necessary for every self-respecting specialist.

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