MODERN LANGUAGES AND TECHNOLOGIES OF PROGRAMMING

Abstract: Comparison of programming languages is a common topic of discussion among software engineers. Multiple programming languages are designed, specified, and implemented every year in order to keep up with the changing programming paradigms, hardware evolution, etc. Application developers keep up with the times. If earlier it was possible to write almost all software in one programming language, now the knowledge of one language is not enough. In 2019, there are many high-level languages in which applications are written.

Keywords: Programming language, Java, C++, syntax.

САВРЕМЕННЫЕ ЯЗЫКИ И ТЕХНОЛОГИИ ПРОГРАММИРОВАНИЯ

Аннотация: Сравнение языков программирования является распространенной темой обсуждения среди разработчиков. Несколько языков программирования разрабатываются, определяются и внедряются каждый год, чтобы не отставать от меняющихся парадигм программирования,
Introduction

A programming language is a vocabulary and set of grammatical rules for instructing computer or computing device to perform specific tasks.

Each programming language has a unique set of keywords and a special syntax for organizing program instructions.

Programming languages are fascinating and interesting field of study. Computer scientists tend to create new programming language. Thousand different languages have been created in the last few years. Some languages enjoy wide popularity and others introduce new features. Each language has its advantages and disadvantages. The present work provides a comparison of various properties, paradigms, and features used by a couple of popular programming languages: C++, PHP, C#, Java, Python, VB, JS and others. With this variety of languages and their widespread use, software designers and programmers should be aware of the benefits and drawbacks that each language could bring to their software solution, and be careful when they make rational decisions. These languages are compared under the characteristics of reusability, reliability, portability, availability of compilers and tools, readability, efficiency, familiarity and expressiveness. Other criteria, like the programming effort, run time efficiency, memory consumption, and database connectivity are disclosed by implementing and running the same set of programs using all the languages under the study.
A working tool for creating computer programs is programming languages. Their development has been going on for about fifty years. The most advanced and, therefore, popular among programmers are the programming languages discussed below.

**C ++**

Despite the fact that this programming language was created in the early eighties of the last century, it can be attributed to the modern one, since it has not lost popularity among programmers, but rather is used by high-level professionals. To this day, C-plus-plus is considered the most common programming language (gradually losing ground, giving way to the languages of the Java family), the ability to master which is the responsibility of any programmer. C ++ was created on the basis of a compiled statistically typed programming language C, as a result of which it inherited from it some disadvantages:

- A relatively inconvenient syntax, due to which errors may occur that are more difficult to recognize, and therefore eliminate. Combined with a complex language specification, the inconvenience of syntax makes it difficult to learn;
- long program code, which leads to increased compilation time and difficulties when using programs;
- poorly implemented module support.

The main advantages of C ++ include the following:
- ease of processing by the C language compiler, and therefore high code compatibility. C ++ code can be used in C with minimal modifications, and vice versa;
- almost complete versatility.
C++ is suitable for solving almost any software task;
- cross-platform and low requirements for computer computing power;
- freedom for the programmer to choose various programming styles: structural, object-oriented, functional, generative.

Language standards are updated periodically. The latter was released in December 2017. C ++ continues to evolve towards increasing productivity and expanding capabilities with new additions to the standard library. In this case, the main rule for the language remains to maintain compatibility with the predecessor language - C. At the same time, as the developers note, writing code in C ++ is much easier.

Java

The Java programming language is highly typed and designed for object-oriented programming. Java, like C ++, is based on the base C language. The main feature of the language is the use of a virtual machine that processes program code regardless of the operating system and computer hardware. The advantage of this processing method includes an increased security, and the disadvantage - a decrease in performance, which is fought with the help of improvements in the methods of working with byte code.

The advantages of the Java language include:
- developed standard libraries that do not require additions; - high degree of portability of programs;
- relative ease of study;
- built-in support for working in computer networks.

The negative qualities include:
- a strong load on the RAM of the machine, and as a result, low speed and low productivity;
- the language has been developing for a long time, so among the additions and basic tools of the language there are tools with completely the same functional meaning.

Over the past few years, Java has been a leader on the list of the best programs for all kinds of developers. Therefore, the relevance of this language, founded in 1990, has not yet been fully exhausted. Java is a leader among programming languages in the segment of mobile applications, the share of development of which in the labor market, for programmers, is constantly increasing. There is also a high proportion of languages belonging to the Java family in web projects.

**Python**

A popular and rapidly developing general-purpose programming language. It has a relatively small number of simple commands, which undoubtedly makes its syntax one of the simplest among modern languages. Ease of learning and a large number of programming styles (including structural, functional, object-oriented, imperative and aspect-oriented) are the undoubted advantages of the so-called Python. Code written in Python by one programmer is easily read by others, which makes it easier to work with code.

Other advantages of Python:

- the ability to check for errors of a particular section of the program, and not just the whole;
- portability for almost all modern platforms;
- a large standard library;
- interoperability with languages such as C++ and C.

The disadvantages of this language:

- relatively low speed of execution of algorithms inherent in many interpreted programming languages;
- a large number of errors in the system code;
- problems with data types when transferring files in large projects, due to the use of dynamic typing.
Python has become one of the leaders in the web application development segment, while it constantly finds new fans and strengthens its position among programmers. The language has many implementations tailored to solve various problems on any platform. Among them: PyPy, IronPython, Stackless, Jython, Unladen Swallow, Micro Python and others.

**Conclusion**

In modern times, programmers have a whole assortment of programming languages with many different properties. Their development does not stop, but, on the contrary, only accelerates, and in the direction of increasing the number of varieties of languages. Therefore, the choice of the main specialization is becoming increasingly difficult, but at the same time, the knowledge of the main and most common languages that were considered in this article is necessary for every specialist who respects himself.

**REFERENCES**


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