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Programming Features and Technical Analysis of Computer Software Java

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Abstract

With the rapid development of computer technology, various programming languages continue to improve and innovate, and the scopes of their daily applications are also expanding. Java occupies a unique corner in computer software development due to its orientation, independence, directness, and other advantages, and it is a programming language necessary for many computer applications. This paper further analyzes the programming advantages that Java occupies in software development through a brief introduction to the basic definition and characteristics of the Java programming language. Besides, through the mainstream application of the main technology of Java programming, this paper further analyzes and summarizes the Java programming language. We hope that the research on Java programming characteristics and technical analysis can provide references for related parties.

Keywords

Java Programming; Technical Analysis; Computer Software Application.

1. Introduction

In the context of the rapid development of technology in the modern Internet era, various websites and software have become elements that occupy a high proportion of people's work, production, and daily life, and the computer software programming industry has also become a high-demand industry. When selecting the software's programming language, it is necessary to select and combine the characteristics of various programming languages in accordance with the requirements of the software application in different aspects. The Java programming language is the most basic programming language and is widely used in many fields. Although the interpretation method used in its operation is simple to operate, it is a highly safe method. Java also has the advantages of multi-thread and portability and has a considerable development space. This programming language can be improved and updated even when the computer technology is updated at a fast speed and does not fall behind the pace of the progress of the times. These characteristics make Java have an important position in the current Internet and computer applications.

2. Programming Characteristics of Computer Software Java

The Java programming language originated with Sun Microsystems. At that time, the Java language was restricted by business, and there was no way to develop it better. However, with the continuous acceleration of the network development process and updating computer languages, the proportion of computer programs in memory has become larger and larger. More and more computer industry workers recognize and realize the advantages of Java in programming language applications and can use Java language programming applications to solve the problem of insufficient memory. Java has achieved good results in data processing methods and has begun to be recognized and accepted in the industry. The later development and technological updates made Java become one of the important

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roles in software programming, not inferior to the existence of programming language giants such as C language.

2.1 The Programming Definition of Computer Software Java

The Java programming language is a new type of language. It is derived from the development background modified and optimized on the basis of other programming languages, so that the Java programming language is still loved by many developers in a software development environment with rich and diverse types and complex platforms. Java programs are composed of four aspects when they are written and run: programming language, class file format, virtual machine, and application program interface, and it has an independent programming environment Java Development Kit (JDK). JDK is the core of the Java programming language, including Java Runtime Environment, Java API, and some Java tools. Therefore, some characteristics of Java language in writing and platform compilation are the factors that make Java become the current mainstream programming language [1].

2.2 Programming Features of Computer Software Java

We can deeply feel the high sensitivity of Java in programming work through the experience. Compared with other traditional computer programming languages, the Java language directly abandons the multiple old nesting, and its simplified writing syntax can not only improve work efficiency but also reduce the error rate of using multiple nesting methods. In addition to high sensitivity features, Java programming also has the priority of portability, orientation, security, and multi-thread. This paper will introduce and analyze these features one by one.

3. Advantages of Java Programming in Computer Software Development

3.1 Simplification of Syntax

When learning C language or C++ language, many readers may experience the complexity and difficulty of these two languages. Java is a programming language derived from the C language. The C language derives not only Java but also C++. Java has the grammatical basis of C language and C++ language, but when Java is designed and developed, it aims to develop a programming language that is simple to operate. Therefore, in the development process, the sentences and grammars that are low in use in C and C++ languages, which are easy to cause cognitive confusion and are difficult to understand, are discarded, thereby reducing the complexity of programming in the original C language and C++ language. The simplification and optimization of Java in development have improved users' work efficiency in actual operations and applications [2].

3.2 Platform Independence

One of the biggest characteristics of the Java language is its platform independence. This feature creates great use value for modern heterogeneous network environment applications and software applications. Although Java is a derivative language, it not only has an independent structure but also has an independent compilation platform. Using the Java platform, the code can be compiled into a neutral structure format, which is convenient for the compiled code to run and use in any system belonging to the Java platform. When the computer software runs the code, some programming languages need to store the compiled code through secondary compilation. However, the Java platform does not need to compile and change the process and can directly let the written program run in any hardware facility environment.

3.3 Easy to Transplant

In the above description of the platform independence of Java, the neutral structure code format that the Java platform can compile is mentioned. This feature of the Java language provides very good applicability for Java in the operation of various systems and site programs. This advantage stems from the portability of the Java programming language. In the process of programming, program modification is an inevitably encountered problem. Suppose the language method used during development is inconsistent with the language method during modification. In that case, it is easy to

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cause errors in program development or delays in the design and development process. When using the Java programming language to open source, we can directly make the adjustments and changes required by the project on the inherent program framework. Therefore, the Java program used in the web page program can run well in various environments without being restricted by many factors. In addition to this feature, Java also has strict data type length regulations, so that all kinds of fragments can be written and organized to bring users a convenient experience [3].

3.4 Object-Oriented

C language is a process-oriented programming language, and C++, as a derivative of C language, is a mixed language. If C++ is defined as a purely process-oriented or object-oriented language, it does not conform to the actual application situation. Java is a pure object-oriented language that inherits the foundation of C language and absorbs the advantages of C++. In such a system, the primary focus is the collection of classes, which describe the behavior of objects through methods and data, set the state of objects, and integrate layers of data and methods through combination and encapsulation. Inside the class, the program can be organized by methods such as classification and inheritance. In Java, we can also extend the Function in the program through the Extend and the Package.

3.5 High Security

With the upgrading of modern networks, more internet spam and computer viruses follow. In this complex network environment, it is inevitable to add security mechanisms to prevent malicious code attacks when developing programs. Java has a huge advantage in terms of security.

The security mechanism in the Java language encrypts the programming language when developing programs, which undoubtedly puts up a high wall that is difficult to cross in front of malicious offensive code. Before cracking the programming language, understanding the key type of the programming language is the primary goal of these malicious codes, and the key of the Java programming language is the result of its encryption technology. The security mechanism of the Java language can not only encrypt the programming language with a key but also automatically disconnect the data communication channel in time when the computer environment is insecure, so as to avoid data leakage problems caused by attacks and system damage. In terms of downloading network data, Java has also established a rigorous prevention mechanism to prevent the downloaded data from replacing the data stored in the system with the same type of data as the downloaded data to avoid possible threats caused by offensive download data. Java language can also improve the speed of the program by improving the compiler technology, so that it has better performance than the high-level scripting language. Java can also automatically collect and handle program abnormalities, discard operation pointers, and so on.

3.6 Multi-Thread Mechanism

It is necessary to understand the difference between process and thread in program writing. The process is an instance of program execution, while the thread is a smaller running unit and is attached to the process, occupying a small unit of allocated resources. Each thread carries different data or information and needs to complete independent tasks. Using multiple threads to complete tasks in a process can greatly increase the task processing capacity and execution efficiency of the program. The Java language with a multi-thread mechanism can guarantee the normal operation of certain specific program behaviors while sharing thread data. Java's multi-thread mechanism has high accuracy and can effectively complete various characteristic behaviors to realize the function of real-time network data exchange.

4. The Main Technology of Computer Software Java Programming

4.1 JAVA.D.C Technology

The database is an indispensable existence when recording, storing, and reading data. For example, in the construction of the back-end of the web page, the HTML/CSS/JavaScript programming language is used in the front-end of the web page. When the back-end is connected to the database,

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the PHP programming language is also required for login. The Java language system has mastered the Database Connectivity technology (D.C technology), which provides a method for the Java language to connect to the database directly. To connect to the database during software operation, we only need to compile and debug the written code. This technology can also allow open-source developers to realize the unification of classes and interfaces when writing programs and build a high-end data connection tool to support the demand for back-end data. The database connection technology carried by the Java language plays an important role in the effective management of the back-end database management. When a program needs to build a large-scale database in the computer back-end, this technology can play a more conspicuous role [4].

4.2 JAVA Annotation and Java Remote Method Invocation Technologies

Next, this paper will introduce two other technologies: Annotation technology and Remote Method Invocation technology. Remote Method Invocation technology is a technology used to complete a distributed program. The running and communication of programs between the server and the client can be completed by calling classes and objects in the process of writing Java. For open source developers, this technology can effectively integrate all kinds of resource information and ensure the safety and integrity of the overall operation of the program through distributed use and debugging of various small programs in the program branch.

When discussing Annotation technology, Beans is one of the core technologies. It is an efficient security control independent of the Java platform in the open-source process, and it is also a technology that plays an important role in writing. Therefore, Annotation technology can establish connections between attributes, parameters, variables, classes, etc., contained in the Java language system and can provide assistance in integration mechanisms. Combining the above two technologies and their characteristics, open-source developers can classify elements and change the behavior of specific elements by using Element attributes as the division rule. The above two technologies are also necessary technologies for open source developers in the process of programming.

5. Applications of Computer Software Java Programming Technology in the Engineering Field

In modern computer software development, the quality of software development and the design to achieve interaction are important indicators in software design and development. The simplicity, flexibility, and efficient writing advantages of the Java language give Java a foothold in the field of interaction design. In the development process, the writing grammar of the Java language can provide an efficient and targeted method that can accelerate the process of successful software development. The neutrality of its architecture also brings a lot of convenience to the subsequent engineering repair work.

In the above analysis of the advantages of Java programming in development, we mentioned the security mechanism of Java programming. The establishment of this security mechanism allows developers to effectively protect the software code, data, and information when using the Java language for software programming. While allowing development companies to manage information efficiently, it can effectively protect the core information and data of the company.

The strict grammatical aspect of data quantification of the Java language can also be applied to the design of graphics editors. The Java graphics editor is based on the MVC framework and can be independently evolved at different levels. The encapsulation method used in the processing of logical data relations is a better solution in modern programming languages. Therefore, Java is the first choice of many open source developers in the application and use of such fields as view design.

6. Conclusion

This paper describes the basic definition of the Java programming language and analyzes the advantages that Java can show in programming development step by step. Java's security, multi-

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thread mechanism, simplification of syntax, independent platform, and other advantages, firstly provide users with great convenience and guarantee. Secondly, Java's three core technologies have excellent solutions in establishing large-scale databases, effectively classifying elements, changing element characteristics, and implementing the interface between classes and objects. The excellent solutions have once again increased the utilization rate of Java. When choosing a programming language, Java is a better choice, no matter in software design or web page construction.

References

[1] Lu Kong. The use and the exploration of details of JAVA programming language in computer software development [J]. Southern Agricultural Machinery, 2019(6): 170.

[2] Shuang Yan. The application of JAVA programming language in computer software development [J]. Digital World, 2019, (8): 54-55.

[3] Guiling Xiang. The advantages of computer software JAVA programming and its application research[J]. Technology Wind, 2018 (18): 83.

[4] Dingchao Du. Computer software Java programming characteristics and technical analysis[J]. Computer Knowledge and Technology, 2017, 13(36): 215-216.