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Technology Using Capabilities of Visual Programming Languages in Solving Engineering Problems

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Abstract:
This article provides examples of Java programming language for solving technical problems of the university using modern visual methods of programming languages. Problem solving is illustrated by array examples in Java programming language.

Keywords: Programming language, Java platform, JRE - Java Runtime Environment, JVM, Java Virtual Machine, Standalone applications, Web Applications, Enterprise Applications, Mobile Applications, JRE and JDK, arrays, Java.

Introduction

In modern education, great importance is placed on processes that allow improving educational activities. The technological approach in education is an important indicator of high professionalism (skill), a concentrated expression of the level of development achieved, which currently reflects the more informative nature of activity. The demand for pedagogical technologies for the demonstration of visual educational information in teaching is increasing, which not only relies on the principle of traditional visualization in pedagogy, but also expands the possibilities of its interpretation in the active use of educational information resources of Higher Education.

Improving the educational process, directing modern higher education to the formation of effective knowledge and experience, leads to the search for technologies that allow you to pay attention not only to their number, but also to the quality of information. Therefore, the innovative capabilities of pedagogical visualization technology are increasing, which is obtained as a result of the integration of methods of visual representation of information in various areas of scientific,

educational and future professional activity, which can increase the effectiveness of the perception and processing of educational information to a new level.

Using modern programming languages and their visual capabilities, we will be able to find an effective solution to the said problems above. At present, we are all aware that the kata part of the exchange of information is carried out using mobile devices. With this in mind, the vast majority of mobile devices run on the Android operating system(OT)and run on *.supports the apk format. Mobile applications in such a format, on the other hand, are usually created using the Java programming language. We will consider a number of examples of the use of arrays in the Java programming language below, and hope that a lake will come for users when solving these examples of engineering problems using programming languages.

The Java programming language and platform is a high-level, robust, secure, and Object-Oriented Language. A platform is an optional hardware or software environment in which an application can be executed. Java also has its own dedicated execution environment-platform (JRE – Java Runtime Environment). The areas where Java can be used are: personal computer programs (Desktop Applications) – acrobat reader, media player, antiviruses, etc.k; web applications – enterprise-organization applications (Enterprise Applications) - Applications related to banking or production; mobile applications; smart cards; robots; games, etc.k.z.

Main part

The Java programming language should not be confused with the JavaScript language because they are dissimilar. Java software is typically compiled into bytecodes(class file-style), and this ensures that it can run on any Java platform. The Java platform can be a hardware or software environment. Hardware that works directly in Java is rare. We have JVM, the Java Virtual Machine, common.

Basic concepts of the Java programming language: Java is built for the following purposes, it should be such a language:

Be simple, object-oriented, distributed, and easy to learn; robust and hav-free; independent of some device platform or its architecture(i.e. not subject to some platform); very efficient; be it possible to write an interpreter(interpreter) for a programming language; also let the programming language provide parallel operation and use in dynamic typing.

In Java, applications are mostly written in Type 4:

1) Standalone applications – our daily running programs by installing on Linux, Mac or Windows: mp3 player, office, antivirus, etc. They are compiled through AWT, Swing or JavaFX technologies

2) Web Applications – optional programs that work over the network. Note: web applications consist of two parts, the server side and the client side (browser). In Java, it is written only for the server side. In this, from fundamental technologies such as servlet, jsp, jsf, frameworks such as Spring, Play are used. It is generally impossible to write for a browser in a language other than HTML, CSS, and Java Script.

3) Enterprise Applications – these applications have a large swing and are usually used on large fronts. In the work of banks, organizations or astronomy. They require qualities such as high security, equal distribution of load (nagruzka) to servers (load balancing), or clustering (clustering – using a large system as a single object). There are these in Java.

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4) Mobile Applications – Applications compatible with mobile devices can also be written in Java. From Android to Java ME (JME – Java Micro Edition). An example of JME is the JAR games, which are designed for our Nokia phones.

Java's syntax is based on C++. As with all programming languages, the Java programming language has the concept of array. With the help of an array, it will be possible to perform many complex types of issues.

An array is a group of size-bounded variables named after a name that preserves a type of variable. To perform AMAs on one or two variables, it is possible to perform the action you want by creating one or two variables. But are there many of these variables? This creates a number of inconveniences if we create new variables every time for each variable you want to use. In this case, the use of arrays is appropriate.

An array is a structure of information in which values of the same type are stored. Access to one element of the array is carried out using an integer index. For example, if a is an integer, then the value of the expression a [i] is equal to the i-th integer in the array.

The array is declared as follows: First, the array type is defined, that is, the type of elements contained in the array, followed by a pair of empty square brackets, then the name of the variable. For example, how the array of integers is declared is as follows:

int a;

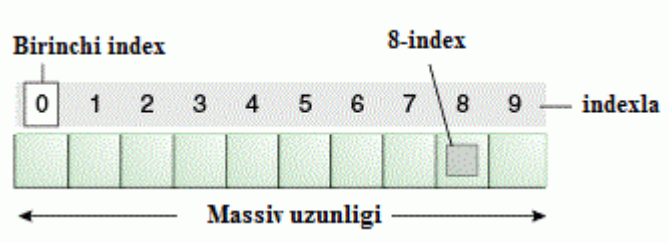
What possibilities do arrays give us:

Optimal codes: we can bring the codes to the optimal level, rewrite or sort very easily.

Optional input: the ability to obtain a value in any index(order), the ability to search.

The disadvantage. The size of the array is given in advance so its size is static. Cannot accept value as desired. Collections are used in such cases(collection).

Array structure.



Arrays can be of 2 different types: one-dimensional and multi-dimensional. One-dimensional arrays will consist of a list of variables of a single type.

In conclusion, it can be said that with the development of mobile technologies, the possibilities of mobile applications are also growing, including mobile applications for Android OS. And in order to increase the possibilities of visual display of information, the contribution of applications that create mobile applications is great. The Java programming language is the leader among them. While creating applications that perform engineering problems using the Java programming language and making them suitable for mobile devices, it simplifies the complexity of solving issues in some way.

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