SOLVING PROBLEMS ON THE TEACHING METHODS OF LINEAR ALGEBRA THROUGH TECHNOLOGY PLATFORM DOT.NET

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Abstract

This article will be considered when solving problems on linear algebra. It present a method in solving this problem with the use of computer technology, and also presents a list of tasks to be solved with various applications that was created on platform DOT.NET. This application is quick and easy to understand and will help everyone to understand linear algebra.

Keywords: Higher mathematics, methods of teaching mathematics, programming

Introduction

Linear algebra is a branch of mathematics that has to do with studying vectors or vector spaces, linear transformations and various systems of linear equations. Vector spaces occur in mathematics and its applications. Linear algebra is widely used in abstract algebra and functional analysis, and also finds numerous applications in natural sciences. It is also used in solving problems such as: computing the rank of a matrix, the computation of the determinant of a matrix, finding the inverse of a matrix, matrix transposition, matrix addition, multiplication and summation of the two.

Here, we considered the training to meet the challenges of this kind of mathematical problems through the development of applications on technologies ASP.NET MVC 3 platform DOT.NET Framework.

Main Text:

.NET Framework is a software platform released by Microsoft in 2002. The basis of this platform is the Common Language Runtime (CLR), which is able to perform both conventional programs and Web server applications. . NET Framework supports the creation of programs written using different programming languages.

It is believed that. NET Framework is Microsoft's answer, and was implemented as a result of the increasing popularity of the Java Platform Sun Microsystems (now owned by Oracle).

Although. NET is a proprietary technology of Microsoft and officially designed to work under the family of Microsoft Windows operating systems, thus there are independent projects (first of all Mono and Portable.NET) that allows .NET to run the program using many other operating systems.

The basic idea of the design of .NET Framework was to guarantee the freedom of the developer by giving him the opportunity to create different types of applications that can run on a variety of devices and in different environments.

The second principle was the orientation of the system which runs using the family of Microsoft Windows operating systems.

Object classes. NET, available for all supported programming languages are contained in the Library Framework Class Library (FCL). FCL includes classes in Windows Forms, ADO.NET, ASP.NET, Language Integrated Query, Windows Presentation Foundation, Windows Communication Foundation, and many others.

One of the main ideas of Microsoft .NET is the software compatible parts written in different languages. For example, a service written in C++ for Microsoft .NET, may be applied to the method of the class library written in Delphi; hence in C#, you can write a class derived from a class written in Visual Basic .NET, but an exception created by the method written in C# can be caught and handled in Delphi. In each of the library (assembly), the .NET has information about its version, which eliminates all the possible conflicts between different versions of assemblies.

Convenient and efficient for users, the technology of .NET has its own advantages for software developers. Programmers .NET allows you to create powerful information systems using all the capabilities of modern computers and networks without implementing helper functions (almost all of these functions takes the platform). It allows you to focus only on the business logic of the product. Consequently, the creators of the programs will be able to create quickly a high-quality (and easy) programs with a host of features, and an integrated internet that users need. This leads to better and cheaper software, and also reduces the number of errors.

Advantage of this technology:

The latest MS ASP.NET 4 technology is applied in the development of web applications, Internet-sites, and web services. The technology was offered by Microsoft company for those who on the ASP.NET base, carries out certain tasks which is connected with the creation of sites with a small amount of data; and equally, as well as for those who works on the creation

of the highly reliable network portal calculated at hundreds of thousands daily visits.

Huge value for a modern site has lack of idle times, not important, there will be it hour or some hours in day. Idle time leads to serious losses, and a blow to reputation in the business world. For this reason, the huge role in working on a website is played by its reliability and resistance to hacker attacks.

Built-in protection against different types of attacks, gives the following opportunities: SQL Injection, overflow of the buffer, XSS, change of the hidden fields and others. The ASP.NET technology raises degree of stability to harmful actions and different types of hacker attacks on the sites constructed on it.

The structure of ASP.NET technologies allows the compilation of a program code and all the pages of a site. The code is interpreted in PHP much more slowly and does not give the necessary effect of productivity.

More especially, it is actively used in the development of a site using the concept of OOP. Thanks to the fact that in site functioning on a server cluster, ASP.NET can be built in it, and an increase in attendance of a site scalability is attained.

The Microsoft.NET platform has a set of built-in technologies for integration of information systems and appendices, such as services web, WCF, JSON, remoting, XML and so forth, thus ASP.NET exists as its part.

Therefore, the existence of such numerous decisions gives the chance of a choice of optimum technology for each separate case. It provides excellent productivity, scalability and, most importantly, safety.

In our case, we use the ASP.NET MVC 3 technology. Beginning with the first main module - Model-View-Controller - , it is a fundamental pattern, which has found applications in many technologies, given the development of new technologies and everyday life easier for programmers. If you start asking architects on how to implement this pattern, then I think you can hear several different answers, resulting in several different solutions. Generally speaking, this combines all of these patterns and selects a User Interface (UI) from logic programming, which allows designers to do their work without thinking about the code of the program. Recalling the programming students are taught in schools, it pops up a picture of a huge number of lines written in the code behind interfaces, which is not a good practice. Hence, there is also an opportunity to highlight a data model that enables developers to create unit tests on them.

MVC consists of three components: View (the user interface), Model (your business logic) and Controller (contains the logic to change the model for certain user actions, realizes Use Case). The basic idea of this pattern is that the controller and view depends on the model, but the model does not

depend on these two components. It just allows you to develop and test a model without knowing anything about the view and controller. The controller also does not need to know about the representation (although in practice, this is not always the case), and one view can switch controllers, so that one and the same controller can be used for different representations (for example, the controller may depend on the user who is logged in). When a user sees an idea, it produces some action which triggers the controller to forward the idea that changes the data model, controller, and it in turn, produces a particular action on the data model. Hence, the view is the last state of the model which displays it to the user.

For most applications, the course of action to create a plug-in is done by ASP.NET MVC. Therefore, to communicate with the database (storage), use the provider ADO.NET, styling and the handling client interface using a Web technology. The structure of web technologies include: Html, CSS, JavaScript (JQuery), Ajax. Html - use to create a web application framework, CSS - use to design a template, JavaScript - use for event processing on the client side, Ajax - use to exchange data between the client and the server without reloading the page (this allows for fast operation). Therefore, database (repository) is usually created on technology SQL Server 2008r2.

This application will help in studying and understanding the solutions of linear algebra problems. With this application, you can see the progress of the set of solutions of the problem in linear algebra and learn how to solve it. As a result of the application will be withdrawn formula used in the making of this problem and the course of solutions in order.

This application is written in the programming language, C#. The client then has the student, the student, or anyone who is interested and needs help in the solutions of the linear algebra opening the browser is installed (by default, Internet Explorer) will be held on operedelennomu that is predetermined address and get to the main page of the application. By signing up, it will take you to the page for solving problems in linear algebra. In this page, the client by selecting a theme related to his task will take him to another page. Clicking on the first link, it will be presented as another challenge, "set specific parameters (such as the size of the matrix)." Having defined this parameters, the client will go to the main page, where the respective parameters will be represented by a blank form to fill. In the prescribed form, tasks would be given and by clicking on the button , it will be sent to the server using the POST method using Ajax technology. In other words, the correctness of the validation will take place on the client side using JavaScript. The controller receives data from respective model (domain) and will again validate data which is transmitted from the client side. Having tested the whole (without the losses that may occur during transmission from the client side to the server) data, the application applies

pre - tested and proven function or procedure and pass parameters to the database. By adopting the parameters, the function (procedure) will process the data on a particular algorithm. Therefore, in solving this problem, record the decisions and response to the variable and pass them for presentation (View). Transmitted data for submission will be checked and displayed on the client side. The whole course of solutions will be presented in order and with commentary on each step of the decision-making process.

Thus, the client can see how to solve this object and check the answer to the problem which is solved independently.

Conclusion

In the future, this application will be useful for all students of linear algebra. With this application, students will better understand some problems in linear algebra and learn how to solve problems on their own.

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