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THE IMPORTANCE OF TEACHING ALGORITHMS AND PROGRAMMING LANGUAGES IN THE CREATION OF ELECTRONIC EDUCATION RESOURCES

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Abstract

Modern, advanced educational technologies and non-traditional methods of teaching are being introduced into the educational process.In this article, we will focus on some aspects of using the methods developed in the teaching of the science of algorithms.It is a well-known fact that university graduates work in various fields, work extensively and achieve good results. The subjects the student is studying and the time allotted for teaching them, the science program is the main focus.

By teaching the science of algorithms in close connection with other disciplines, students will be able to form secular knowledge and be able to work effectively in any field in the future.The spiral form of education focuses on the complex teaching of previously taught topics and the study of deeper algorithms and programming. If we pay attention to the fact that the topics in the secondary school course are given in the form of superstructures, and the topics in academic lyceums and colleges are repeated, we can see that the previous topics are the basis of this superstructure.They carry out the highest and most up-to-date educational process, as their graduates work in various fields and continue their education in the next types of education.

The use of e-learning resources in the teaching of mathematics in secondary schools serves to improve the quality and effectiveness of education. The science of algorithms and programming languages and their teaching have great importance in the creation of e-learning resources.

Keywords: Algorithm, Algorithm, Program, Programming Language, Pascal Programming Language, Delphi Programming Language, Mathematics,e-learning Resources, Teaching Methods, Methods, Quality and Effectiveness of Education.

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INTRODUCTION

By teaching the science of algorithms in close connection with other disciplines, students will be able to form secular knowledge and be able to work effectively in any field in the future.

Modern, advanced educational technologies and non-traditional methods of teaching are being introduced into the educational process. Based on this, we would like to share some of the methods we have developed in teaching the science of algorithms. It is a well-known fact that graduates of universities, work in various fields, have a wide range of activities and achieve good results.

We realize that the subjects that the student is studying and the time allotted for teaching them, as well as the science program that is formed to be taught, are paramount.Is the science program being implemented in full, or is it leading to some reductions?

The use of e-learning resources in the teaching of mathematics in secondary schools serves to improve the quality and effectiveness of education. The science of algorithms and programming languages and their teaching are of great importance in the creation of e-learning resources.

The programming of the science of algorithms and the implementation of the algorithm that is the basis of the science through such reductions deprive it of the process of forming in-depth knowledge. The question is, how can we save time and use it effectively?

The state of the science of algorithms suggests that the teaching of algorithms and programming languages should cover the undergraduate, graduate, and doctoral levels of higher education. To do this, we must first analyze the current state of teaching the science of algorithms and determine the current situation.

THE MAIN RESULTS AND FINDINGS

To solve the problem we have raised above, the textbooks must first cover the basic fundamental concepts and the contributions of our great ancestors to the emergence of this field.Initially, algorithms should be illustrated in schools with definitions, brief information sheets, computer slides, and in higher education, they should be enriched with more complex and coherent content and formula-based expressions and programs.At the undergraduate level, knowledge of the topics that form the basis of the master's degree program should be based on complex mathematical apparatus, recurrent formulas, ie recalculations using intermediate results, arrays, ie table sizes, and other basic concepts.At the undergraduate level, we have to teach the basics of the subjects taught in the master's program, such as complex mathematical apparatus, recurrent formulas, intermediate results, table sizes, and other basic concepts.

Such topics include complex algorithms, such as branching and iterative algorithms, working with arrays, and more. The previous topics should help to teach the next stage Algorithms, the topics should be divided from simple to complex on the principle of sequence and consistency, according to the principles of science. Each stage of programming differs from the previous stage in the richness of information, the method of solving, and the level of complexity. This leads to retraining of topics in the later stages.

The spiral form of education focuses on the complex teaching of previously taught topics and the study of deeper algorithms and

programming. If we pay attention to the fact that the subjects of the general school course are repeated in the course of academic lyceums and colleges, we will see that the previous topics are given in the form of superstructures, which are the basis of this superstructure in academic lyceums and colleges. Everyone knows that the highest and most up-to-date educational process takes place in academic lyceums and colleges. Because their executors work in different fields, they will continue their education in the next types of education. It is inevitable that graduates will work as workers in agriculture and manufacturing and construction, or work directly through information technology, including the Internet. To do this, they must master the Algorithms and its sections, including "conditional and unconditional transitions", "algorithms for iterative processes". In general secondary schools or academic lyceums and colleges, these departments are taught and students are given the basics of knowledge.

The traditional methodology of the science of algorithms in general education school The concept of algorithms implies a simpler teaching in the discipline of "Computer Science", teaching in academic lyceums and colleges is the interpretation of complex processes, the abundance of software and analysis of the results differs from At the undergraduate level, the problem-solving stages in the teaching of the science of algorithms include the use of all the concepts of the programming language, starting with the alphabet of Pascal or Delphi programming languages.

In order to be more observant in the master's program, you have to program higher-level mathematical calculations. If you do not have to program such a calculation, you will not have a clear idea of the process.

But in order to save time, it is necessary to give up some details in traditional teaching. This leads to discrete values, such as "gaps" in education. For the continuity of this process, it is possible to show complex distributions, derivations, relationships in formulas, graphical representation of computer programs. This process requires the allocation of computerized material for education. It is important not only to computerize the extracted material, but also to technologicalize it.

In teaching the science of algorithms, it is also advisable to teach the lessons in new non-traditional "advanced speech", "brainstorming", "small group style", "large group style", very active computer methods.

A special course on Algorithms is organized in this direction, which should be taught not only in academic lyceums and colleges, but also in the univewrsities. Topics should be taught mainly through problem-solving steps, linear algorithms, branching and iterative algorithms. It should also be taught through the use of language modules.

The use of Pascal programming or Delphi programming language is also effective in traditional teaching of algorithms. Traditional teaching of algorithms in the form of information technology and virtual laboratory classes, as well as creative methods of teaching on the basis of non-traditional methods contribute to the implementation of the state program.

The science of algorithms “1.Programming of linear algorithms. 2. Programming of branching algorithms. 3. Programming iterative algorithms. ” Concepts are of great importance. We have selected the following topics from Algorithm Science as the most difficult topics to teach.

1. Linear algorithms;
2. Branching algorithms;
3. Repetitive algorithms;
4. For the general case (for indexed variables);
5. Find the greatest divisor of the two (EKUB);
6. Create an algorithm for solving the equation;
7. Determine the maximum and minimum value;
8. Concerning the formation of random quantities;
9. On working with the calendar;
10. Sort (or select) array elements according to a specific requirement.

In order to master these topics, the following topics can be included in the topics that are difficult to teach, and it is important to teach them:

1. Programming of linear algorithms;
2. Programming of branching algorithms;
3. Programming iterative algorithms.

Of course, the description of these topics can be used as a basis for a more consistent study of traditional or non-traditional methods. The importance of the above topics is that they cover the fundamental topics of Algorithms. Effective lectures and e-textbooks on these topics, as well as laboratories and workshops organized to strengthen the above topics. The selected topics are selected based on complexity criteria. They are designed not only for e-textbooks, but also for practical classes and laboratory classes. An algorithm for solving the problem developed, and its block diagram and program created.

For example, of course, the teaching of "theoretical and practical concepts" in secondary education, academic lyceums and colleges is the basis for development at the undergraduate level.

So, it is necessary to create the basic fundamental concepts and the foundation of the given content, first of all, to distinguish general and basic concepts and fundamental themes on their basis. It is also important to choose topics that are difficult to read. These are the topics we have highlighted above. The main goal is to achieve the formation of the concept of "Algorithms" on the basis of selected topics. This process is divided into 7 stages and we call them as follows.

1. The exact expression of the condition of the problem is also called the mathematical statement of the problem, and the solution of any problem begins with its statement. Problem statement separates the source data or arguments and the values whose values need to be determined. Asking a question is the first step in solving it.
2. In solving practical problems, it is necessary to deal with objects - natural phenomena, physical or production processes, production processes, production plans, and so on. In order to ask such questions, it is necessary to first describe the object under investigation in mathematical terms, that is, to build a mathematical model (expression) of it, if possible, which will allow to examine the real object to solve a mathematical problem. This stage is the second stage of solving problems on the computer.
3. Once a mathematical model of the problem is created, the search for a solution begins. In some cases, it may be necessary to move directly to the problem-solving method after the problem has been posed. Such problems may not be represented by an explicit mathematical model. This stage is the third stage of solving problems on an electronic computer.
4. In the next step, the fourth step, an algorithm is created to solve the problem using an electronic calculator. Algorithms can be written in a variety of ways. One of the main tasks of the science of algorithms is to study the methods of building algorithms. In the process, students develop an algorithmic way of solving a problem, that is, a way of thinking algorithmically.
5. For an algorithm to be executed on an electronic computer, the algorithm must be written in a programming language. This is the fifth step in solving the problem, in which an algorithm written in one way or another is translated into a specific programming language.
6. The sixth step is to perform an algorithm written in the form of a program using an electronic calculator. This step ends with getting the result. This step is the most

difficult for the programmer, as some errors may occur when entering the program into the machine's memory.

7. Finally, the final seventh step in solving the problem is to analyze the results obtained. This step is performed to determine how close the results are to reality. The analysis of the results helps to determine the algorithm, the solution and the model, if necessary.

Each of these stages requires special attention and mastery. The stages also have their own characteristics and are the main result. If the result is inconsistent with the nature of the problem, then all steps are incorrect.

Currently, the concepts of programming are not sufficiently described in textbooks, practical classes and laboratory manuals for lectures published for students. If they were introduced, the science of algorithms would contribute to the qualitative formation of imagination. It is obvious that the topics assigned to students are taught and enriched at each stage of education, and they differ accordingly. If all the knowledge is given in order to master the science of "algorithms", then there will be a lot of programmers. We believe that this will be a contribution to the development of our republic.

Problem: The sides of a triangle are given by the lengths a, b, c.

a) The length of its height;
b) The length of its median;
c) The length of its bisector;
d) Create a block diagram and program of the algorithm for calculating the radii of the inner and outer circles.

First of all, it is necessary to find out what information is given to students. The lengths of the sides of a triangle are given. It is necessary to determine whether these are indeed sides of a triangle, for which students need to be reminded of the concepts of the existence of a triangle in geometry, it means a + b> c, a + c> b and b + c>a if these conditions are satisfied there is a triangle and the required ones can be calculated.

P= (a+b+c)/2 half perimeter,

$S=\sqrt{p(p-a)(p-b)(p-c)}$face of triangle,

$ha= 2\cdot\sqrt{p(p-a)(p-b)(p-c)}/a$, the height lowered to a,

$hb= 2\cdot\sqrt{p(p-a)(p-b)(p-c)}/b$, height down to b,

$hc = 2\cdot\sqrt{p(p-a)(p-b)(p-c)}/c$, height lowered to c,

$ma = \sqrt{2\cdot b^2+2\cdot c^2-a^2}/2$,the median of the side a,

$mb = \sqrt{2\cdot a^2+2\cdot c^2-b^2}/2$,the median of the sideb,

$mc = \sqrt{2\cdot a^2+2\cdot b^2-c^2}/2$, the median of the sidec,

$la = \sqrt{bcp(p-a)}/(b+c)$, the bisector passing through a,

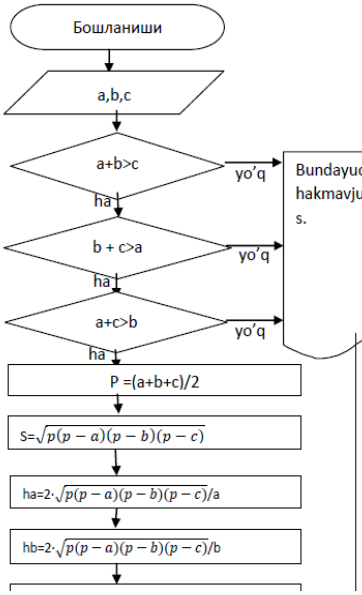
$lb = \sqrt{acp(p-b)}/(a+c)$, the bisector passing throughb,

$lc = \sqrt{abp(p-c)}/(a+b)$, the bisector passing through c,

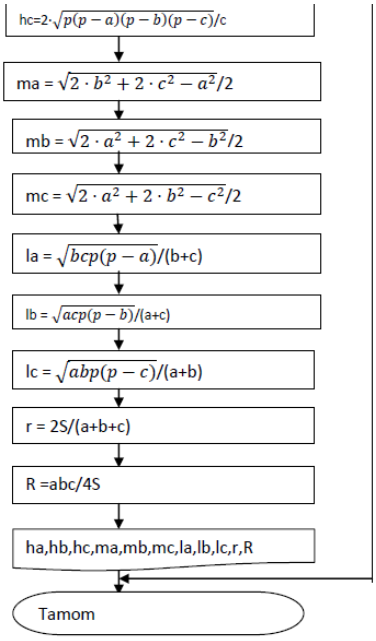
r = 2S/(a+b+c), the radius of the circle inside the triangle,

R = abc/4S, the radius of the circle on the outside of the triangle,

A student who knows these formulas will have a clear idea of the nature of the problem and will have a sufficient understanding of the problem-solving algorithm. The algorithmic block diagram of the problem is given below in Pascal programming language.




```
Program ucburchak;
Label 1, 2;
Var a, b, c: real; ha, hb, hc: real;
ma, mb, mc: real; la, lb, lc: real;
p, S, ri, Rt: real;
begin
readln(a, b, c);
ifa+c<b then goto 1;
ifa+b<c then goto 1;
ifb+c<a then goto 1;
p:=(a+b+c)/2;
S:=sqrt(p*(p-a)*(p-b)*(p-c));
ha:=2* sqrt(p*(p-a)*(p-b)*(p-c))/a;
hb:=2* sqrt(p*(p-a)*(p-b)*(p-c))/b;
hc:=2* sqrt(p*(p-a)*(p-b)*(p-c))/c;
ma:=sqrt(2*sqr(b)+2*sqr(c)-sqr(a))/2;
mb:=sqrt(2*sqr(a)+2*sqr(c)-sqr(b))/2;
mc:=sqrt(2*sqr(a)+2*sqr(b)-sqr(c))/2;
la:=sqrt(b*c*p*(p-a))/(b+c);
lb:=sqrt(a*c*p*(p-b))/(a+c);
```




```
    lc:=sqrt(a*b*p*(p-c))/(a+b);
    ri:=2*S/(a+b+c);
    Rt:=(a*b*c)/(4*S);
Writeln(a,' tomon. Tush. balandli', ha);
Writeln(b,' tomon. Tush. balandli', hb);
Writeln(c,' tomon. Tush. balandli', hc);
Writeln(a,' tomon. Tush. mediana', ma);
Writeln(b,' tomon. Tush. mediana', mb);
Writeln(c,' tomon. Tush. mediana', mc);
Writeln(a,' tomon. Tush. bissiktris', la);
Writeln(b,' tomon. Tush. bissiktris', lb);
Writeln(c,' tomon. Tush. bissiktris', lc);
Writeln('ichkichizilganaylana rad', ri);
Writeln('tashqichizilganaylana rad', Rt);
Goto 2;
1: Writeln('bundayuchburchakmavjud
emas');
2: end.
```

CONCLUSION

We believe that this method will help students develop the following knowledge, skills, and abilities:

- Students are first introduced to a short written text of the problem (exercise, problem, topic) to be taught and analyzed;
- The results obtained by students on the problem, the decisions made are discussed in the classroom and a clear conclusion is reached;
- A program based on the created algorithm is entered into the computer's memory and the result is obtained, and the result is analyzed;
- Such a course teaches students to approach the problem differently and analyze it;
- In this process, the student compares his knowledge with the knowledge of his peers, exchanges ideas with them;
- The ability to apply theoretical knowledge in practice;
- This method allows students to select information, select the necessary, and gain such knowledge;
- Students develop the ability to find and establish the relationship between different information;
- This method helps students to develop a sense of anticipation and intuition.

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