

Analysis of the Stages of Studying the Subject of “Algorithms” in the Course of Computer Science in General Secondary Schools

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Abstract: Factors such as the stages of studying the topics of the Department of Fundamentals of Programming in general secondary schools, their continuous development and the level of preparation for modern programming are among the factors that need sufficient attention in the history of computer science. This article explores the algorithmic processes, programming elements, and modern stages of programming for young students and lists the factors that motivate them to become future professionals.

Keywords: program, programming, stages of learning, technologies, applications, algorithms.

I. Introduction

It is no secret that the so-called "Information Age" of the XXI century shows the value of information resources, which will become the most valuable and unique in the future. Indeed, during the 1920s, the information resource became so important in society that there was no other resource to replace it. As long as the information resource is the primary resource, the processes that take place over it will remain the primary processes.

It is the world's leading information processing systems for resource processing. Search engines such as Google, Yandex, Bing, social networks, government information systems, military information systems, international information systems, NASA space agency are good examples. In this context, it is important to teach young people concepts such as digital information and its processing, the principles of software development, algorithms and mathematical modeling.

II. Main part

Since the advent of computer science in schools of our country, one of the main topics of science has been "Algorithms". This topic was studied by the first computer users who appeared in the former Soviet schools, even without the use of computers. In the first school computers were installed programs that allow you to create computer programs independently in the BASIC programming language.

With the development of computer science in the school curriculum, the number of subjects studied has increased. The topic of “Algorithms” has become an integral part of the material in school textbooks, and students have become only superficially acquainted with the topic of “Programming”. And only in specialized colleges and lyceums has this subject been studied more fully.

Programming can be divided into topics that are more complex for students, and it must be acknowledged that solutions using the topic of “algorithms and programming” help to develop algorithmic thinking and the formation of learning skills in school children.

In order for a student to successfully solve the problems required to create algorithms and write various programs, he/she must:

- read the issue carefully and understand the status of the task;
- determine the type of problem, choose a solution;
- development of algorithms for problems;
- programming based on algorithms;
- make sure that the program works perfectly;
- if there are errors during the inspection, it is necessary to return to the first paragraph to correct them.

Practice shows that after exploring the topic of “algorithms and programming,” students solve other similar problems in other school subjects. Often this happens in math and physics classes, where a properly structured algorithm of actions allows the result to be achieved. Advanced algorithmic thinking is necessary in writing reports, essays and research papers. In addition, students should explain that we need to perform a sequence of similar actions to solve everyday or organizational problems. For example, when we are doing renovations in our apartment, we are planning an agenda or arranging a trip to school.

The first thing you start to study this topic is to define this algorithm. Already in primary school, children are introduced to the concept of algorithms in the propaedeutic course in the teaching of computer science. A formal definition of this concept is given when high school students study the topic of the basics of algorithm theory only in 7th grade with an in-depth study of individual topics. The study of the concept of algorithm is inextricably linked with the concept of the executor and the system of executor communities.

One-year methods are a school with a writing algorithm -algorithmic construction. When studying this method of writing algorithms, you should pay attention to the fact that the basic algorithm can be expressed using basic structures: tracking, branching, and loop constructions. Only by realizing this fact can students succeed in the practical application of systematic programming techniques in the future. The application of algorithmic structures in practice, such as transfer and branching, involves the use of logical expressions, the construction of which is simply impossible without concepts such as statement, logical expressions, and logical value, respectively.

A program is, by definition, an algorithm suitable for perception and execution by a personal computer. There are different programming languages for expressing algorithms in this form. Using them, algorithmic constructions are constructed using corresponding operators.

The data is traditionally referred to as the data displayed in the introductory part of the program. For the computer to successfully process data, the most important problem must be solved - to present the data in a convenient form.

The science of computer science refers to the exact sciences and only deals with clearly, mathematically described structural data. Examples of structural data include numbers, sequences, tables, graphs, rows, logical values, and so on. These data structures existed before they were used in programming. In the 18th century, mathematicians used these structures, they still did not think that the era of informatization was coming and computers would appear.

The effectiveness of solving tasks directly depends on the data structure we choose. The aggregation of these structures is done using appropriate types of data.

In computer science classes, children are introduced to a variety of algorithms using the most common data structures. In turn, if you are learning a programming language, you need to work with arrays first. We list several operations: search and replace an element, determine the largest (smallest) by the value of the element, sort the array components by a given condition, and other manipulations. In specially prepared sessions, topics will be considered in developing strategies for winning games.

Nowadays, programming is a more complex process that requires students to have a good knowledge of programming technology and the ability to manage programming systems. In particular, the indirect use of object-oriented programming is a clear example of this.

III. Conclusion

Students should be able to:

- creation and application of flow charts using algorithmic language;
- use of a manual step-by-step verification of the algorithm for key executors;
- application of initial linear, method and branching algorithms;
- complete execution of the auxiliary algorithm for task sorting;
- undeveloped complex computing programs, use of integers;
- for example, writing programs using a programming environment, Pascal ABC;
- testing and fixing the finished program.
- In general, the student should master the algorithms so carefully during school that these knowledge and skills should be reflected and effective in other areas, as well as in other disciplines. A person who is able to put everything into an algorithm in an orderly manner will inevitably move forward to a higher future.

References:

1. Andreeva E.V. Mathematical foundations of computer science. Elective course: Study guide / E.V. Andreeva, L.L. Bosova, N. D. Fomina - M.: BINOM. Knowledge Laboratory, 2005. - 238 p.
2. Pospelov D.A. Informatics: Encyclopedic Dictionary. / D.A. Pospelov. - M.: Education, 1994. - 352 p.
3. Hayitov A.G. Theory and practice of computerization of teaching the basics of computer science and engineering in general secondary education. Abstract of the dissertation for the degree of Doctor of Pedagogical Sciences. Tashkent, 2006
4. Abdukodirov A., Hayitov A.G. Methods of teaching the basics of computer science and engineering. / Teacher's Guide (based on 9th grade textbook). -Buxoro, 2004. -174 p.