



FORMATION OF STUDENTS' KNOWLEDGE AND SKILLS BY CREATING PRACTICAL PROGRAMS IN THE PYTHON PROGRAMMING LANGUAGE

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Abstract: At a time when modern information technologies are widely developed, it is one of the urgent issues to approach the teaching of programming languages to students of general education schools with a special method, to develop simplified methods, and to assign tasks taking into account the age of the students. Students in general secondary schools are encouraged to develop independent programming skills, interest in programming languages, and motivate them to find their place in the future and create excellent programs for the development of the country.

Key words: program, learning methods, programming environment, functions, procedure, component, application, database.

Nowadays, informatization covers all spheres of human activity, and this phenomenon requires high information culture from everyone. Therefore, it is necessary to supplement the science curriculum of the school with subjects that ensure the development of knowledge, skills and abilities of students. Today's task of education is to teach students to be able to work independently in the conditions of an informational educational environment that is increasing day by day, to effectively use modern information technologies in various fields, and to use the flow of information wisely. For this purpose, creating opportunities and conditions for continuous independent work for students and teaching them to think creatively and make independent decisions leads to an increase in the quality of education.

Nowadays, several programming languages have been developed, such as Pascal, Delphi, C++, C#, Python, Java, etc. These programming languages are designed to solve problems in a certain direction, and they can be called object-oriented programming languages. Before talking about programming languages, we found it necessary to dwell on the essence of the concepts "program", "programming", "programming environment".

A program is a clear and complete expression of a formal (conditional) algorithmic language, taking into account the conditions, purpose and task of the work performed on the basis of a pre-prepared algorithm and computing tools.

A program is a plan of work or an activity. A program is a sequence of actions that a computer must perform to solve a problem.

A programming language is a formal language in which programs (sets of instructions) are written for computers, forcing it to perform certain actions.

We believe that programming is the process of creating, testing, and debugging programs for computers and other microprocessor-based electronic machines. In other words, the process of creating a program for a computer is programming, and a person who creates a program is called a programmer. A language that a computer understands is called a programming language.

Programming environment is the language and environment in which the programmer writes the code. For example: An example is a widespread and multi-user environment. PHPStorm is mainly for PHP developers, VisualStudio is for .Net developers, NetBeans is for Java, PHP developers, PHPDesigner is mainly for web (PHP) developers. Nowadays, programming is done using high-level programming

languages (Delphi, Java, C++, S#, Python). The semantics of these programming languages are close to human language, making the process of programming easier.

The following key concepts are important in learning the Python programming language. A function is a part of a program that performs a specific task, has a name, accepts one or more values, and returns one or more result values to the main program after completing the work.

The part program is called when necessary. It can be used multiple times throughout the program, eliminating the need to write the same code multiple times. This increases the blockability of the code, makes it easier to understand, and helps in finding errors. A single block of code can be checked for errors. If the error is in the part of the program, only the part of the program itself needs to be corrected. If the code is written repeatedly in several places without using the part program, then you have to search for errors throughout the program.

a) the code will need to be updated in only one place: All the corrections made will take effect as soon as the part program is called.

b) procedure - a reusable part similar to a function is a program, the only difference is that it does not return any value.

The Python programming language has several useful standard functions designed to solve various problems:

Each function and procedure must be named, and this name begins with the keyword `def`, derived from the word `define` in Python.

`def` is the keyword that declares a function.

`function_name` - function name.

`parameter list` - this list can consist of several parameters and they are separated by commas.

`command_block` - the body of the function must be written with a single letter, like other operators.

When a function is called by name, the sequence of commands it contains is executed. After that, the program returns to the line where the function was called and proceeds to the next commands on that line.

In Python, procedures are written almost like functions. The difference is that procedures do not return any value.

A function calling itself is called recursion, and such functions are called recursive functions.

Recursive functions are a powerful programming mechanism, but they are not always efficient. Because in most cases he makes mistakes. The most common error is infinite recursion. In this case, the function call chain is infinite and continues until the computer runs out of free memory. Reasons why infinite recursion occurs:

a) Incorrect use of condition in recursion. For example, if we forget if $n \neq 0$ when calculating the factorial, the `factorial(0)` function will call `factorial(-1)`, and the `factorial(-1)` function will call `factorial(-2)` and so on;

b) calling a recursive function with an incorrect parameter. For example, if the `factorial(n)` function calls `factorial(n)`, an infinite chain will occur again. Therefore, when creating a recursive function, it is necessary to think about the condition for ending the recursion and when and how to end the recursion.

Python programming language is an object-oriented programming language that is easy to understand and easy to learn. The advantages of Python programming language are that

first: the program created in this programming language works on other platforms and operating systems;

second: code written on one platform or operating system may occupy different memory when ported to another platform or operating system. This may lead to some errors. An example of such programs is the C programming language. And in the Python programming language, such a deficiency has been eliminated;

It is known that the C language was created by Danny Ricci, and the C++ language was created by B. Straustrup. Unlike most programming languages, C did not have a standard until 1989. During this period, the book of B. Kernigan and D. Ritchie, published in 1978, was used as a working manual. Appendices to this book are usually designated by the special abbreviation K&R. The second edition of this book is adapted to the ANSI (American National Standards Institute) language standard called ANSI C. There is also an ISO S (International Standard Organization S) standard. The difference between these standards is very small. The program is mainly based on the ANSI C standard.

Of course, programming plays a key role in training mature specialists for the ICT field. A student who has fully mastered programming can develop software products based on his imagination and learn new things quickly. Below we will talk about advanced methods of teaching programming based on foreign experience. In order to ensure the quality of pedagogic personnel training in undergraduate courses, to inform students of the latest achievements of scientific development, to include the innovations in the field of science and technology in the content of the curriculum today, and to create a foundation for the formation of modern knowledge on the basis of these. is important. Consequently, modern teaching technologies, methodological approaches related to them create favorable conditions for relatively easy, deep and solid formation of necessary knowledge, important laws, and many fundamental concepts in the future pedagogic personnel.

In conclusion, it can be noted that the following main tasks should be performed when learning the basics of programming based on interactive methods:

- a) creating a syllabus reflecting the content of the subject by the teacher;
- b) covering the methods of organizing training based on modern interactive technologies based on today's requirements;
- d) creating presentations on the completed developments related to the organization of training on the basis of interactive methods;
- d) drawing up instructions for organizing training on the basis of interactive technologies and instructions for independent education;
- c) creating a collection of cases, practical assignments, developments and putting them into practice regarding the organization of training on the basis of interactive technologies.

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