CREATIVE TASKS USING INFORMATION TECHNOLOGIES ON THE SUBJECT "ALGORITHM THEORY"

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Annotation

The article presents examples of creative tasks included in the software package in support of the subject "Theory of Algorithms". Creative tasks are presented along with guidelines for them. Characteristics are given that must be taken into account when developing and using such tasks in the educational process.

Keywords: Theory of Algorithms, software and methodological complex, creative task.

Introduction

The main criterion for modern education in our country is the creation of conditions for a transition to a new level of quality based on information technology through the formation of an information and communication educational environment. A special role in improving the quality of education is to play its informatization, understood not as a simple representation of educational information in digital form, but as the creation of a pedagogically designed information and educational environment of an educational institution connected to the world educational space and satisfying the cultural and educational needs of a modern young man. In this process, an important role is given to the creation and effective use of educational information resources. An important component of development in this direction is the active use of electronic program-methodological complexes (PMC), focused on various educational disciplines. PMK contains a system of teaching aids for a specific subject, which include a variety of educational materials, means of knowledge control, etc.

PMK is an integral part of the modern educational process at the university, as it offers a rich and varied educational material, the appropriate use of hypermedia in education, while being both a teaching tool and an example of the use of information technology. An example is the teaching methodology of the discipline “Theory of Algorithms” through the PMC developed at the Department of Applied Mathematics and Computer Science of Termez State University. Since the independent work of students is an integral part of any educational process, the independent work unit is an important component of the PMC in the subject "Theory of Algorithms". This block contains materials on the organization of independent work of students in the subject, which include the system of creative tasks using information technology. Here are some creative tasks that are used in the teaching of subjects "Theory of Algorithms" for students of the direction "Applied Mathematics and Computer Science":

1. The project task using the technology of reporting materials Web-quest (the task is intended for group development). Create a Web site on the pages of which the process and the result of independent work on a given topic is reflected (for example, “Developing programs for a Turing machine”).

Methodical instructions for students. The site contains pages created by the students themselves during the research process, as well as Internet links to works, databases, Internet magazines, etc., which are logically related to the problem developed by the project. In addition, the site includes the following sections:

• introduction, which describes the problem, work plan on it, the roles of project participants;
• The main task to be performed by the participants;
• list of information resources;
• description of the work procedure;
• findings and conclusions.

To effectively complete this kind of tasks for students, electronic forms of various report documents must be preliminarily prepared.

2. The project of the popular science magazine using MS PowerPoint. Develop a project of a popular science magazine on this topic and create a system of dynamic presentations using the capabilities of MS PowerPoint. For example, a magazine may be called “Problems of

Algorithmization," and the work to create it reflects the connection between algorithmic methods and their implementation.

Methodical instructions for students. When creating a journal project, be guided by the following project evaluation criteria:

• the content side of the presentation: (relevance of the topic, non-standard presentation of the material, the presence of vivid and convincing examples, identification of possible paradoxical situations, etc.);

• technical side of the project: the use of modern information technologies and tools at various stages of the project. For example, think over and implement a possible system of hyperlinks for easy access to various sections of the magazine that may interest the reader, and buttons for returning to the page with the content. It seems appropriate to create a table of contents in the form of a hierarchical scheme of interconnected sections;

• presentation of results: presentation presentation and quality of presentation of work results while protecting the project.

When preparing a presentation, pay attention to the creation of imagery and structuredness of the information presented. This can be achieved through the use of a visual representation of the content using diagrams, drawings, tables and graphs. The slide should not be oversaturated with text that would otherwise be difficult to read. When choosing presentation design and creating effects, try not to distract attention from the content (which is why in most cases it is recommended to use a light background and a dark font color and not abuse the animation).

3. Tasks for the development of tests in electronic form. Develop electronic forms for different test tasks for any of the topics in the Theory of Algorithms discipline: for recognition: alternative, for distinguishing, for establishing correspondence, for establishing the correct sequence; to play from memory: in addition to limiting the response (substitution); to reproduce at the level of understanding and applying knowledge in a familiar situation: to a freely constructed answer, to conformity, a typical task.

Methodical instructions for students. When evaluating the task, the following are taken into account: the correctness of the electronic test, the convenience of its use, as well as the

content of the test questions (their correctness, relevance, scientific, non-standard, research level, interdisciplinary nature).

4. The task of developing a hypertext study guide. Develop a draft hypertext study guide on the topic "Recursive Functions". Performing this task contributes to the development of the following skills among students: to analyze educational material, structure it in the necessary way, highlight its main and secondary ideas; determine the relationship between the constituent parts of the content.

Methodical instructions for students. Project Evaluation Criteria:

• content side: relevance, non-standard presentation of the material, the availability of examples and schemes;

• technical side of the project: the use of modern information technologies and tools at various stages of the project;

• presentation of the results. Visibility of the presentation and the quality of the presentation of the results of work while protecting the project.

5. Task for the development of databases, glossaries. Develop a database that will contain a dictionary of concepts and terms of the subject "Algorithm Theory".

Methodical instructions for students. The database should include several linked tables with the following information:

• definition of concepts and categories;

• examples and counter-examples, reflecting the essence of concepts, schemes, figures, symbols;

• the relationship of concepts with other categories;

• causes of concepts, historical references;

• application of concepts in practice.

Thus, while working on compiling a database in the form of a glossary and using it when studying a subject, students more deeply understand the essence of the studied concepts, processes, phenomena, as well as their relationship with other objects.

Creative tasks in academic subjects using information technology are tasks of a search and research orientation, the solution and presentation of the results of which involve the use of

information resources and technologies; while their conditions are supplemented by guidelines and recommendations. The latter may include a description of self-test methods, criteria for the correctness of the solution, typical errors, which will allow students to switch from activities on the model to self-design solutions.

The most important characteristics that must be considered when developing and using such tasks in the educational process are the following:

• the content of the tasks has a search, research, applied and professional orientation;

• organization of solving such problems involves both individual and group forms of students' work; tasks can be applied at all stages of the learning process (from the perception of knowledge, their understanding and understanding through consolidation and systematization, generalization, application);

• as a result of solving search-research problems, students develop methods of theoretical, creative thinking, the hallmarks of which are the ability to design and construct, transfer or model methods for solving problems; they acquire the skills of system analysis, the ability to predict both the immediate and long-term consequences of activity, to correlate them with the goals set. The mentioned skills form the basis of a number of key competencies that contribute to the effective self-education of students and research in the field of their future profession.

References

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