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DEVELOPMENT OF AN ELECTRONIC EDUCATIONAL AND METHODOLOGICAL COMPLEX FOR THE DISCIPLINE «ALGORITHMS AND DATA STRUCTURES»

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«Algorithms and data structures» is a basic course for computer science majors, the course content is abstract, and the traditional teaching methods of board books and slide projections are difficult to show its internal process, which is often difficult for students to understand. Through the algorithm demonstration software, data structures and algorithms are dynamically displayed in a graphical way, which helps to deepen students' understanding of the course content. In this paper, we have researched related materials and literature at home and abroad, and designed a data structure and algorithm dynamic demonstration platform on the basis of analyzing the deficiencies of existing data structure and algorithm demonstration systems and the demand for dynamic demonstration of data structures and algorithms, which is a programming practice platform, and students can not only watch the graphical dynamic demonstration of data structures and algorithms, but also write the implementation code of data structures and algorithms personally through the platform. Students can not only watch the graphical dynamic demonstration of data structures and algorithms through this platform, but also write the implementation code of data structures and algorithms themselves, which is compiled by the compiler of the platform to generate the assembly code, and then the platform dynamically demonstrates the corresponding data structures and algorithms in the form of graphs in accordance with the commands of assembly code. While the data structures and algorithms are being demonstrated, the platform will also display the values of the main variables of interest for the execution of the algorithms, the output results, and the corresponding source codes in the respective windows simultaneously. Students can set the speed of the dynamic demonstration and control the process of dynamic demonstration. This paper applies the compilation principle, assembly code, observer pattern and factory pattern and other related theories and techniques to the platform, and carries out a detailed design of the platform's main functional modules such as the compilation module, regulation module, dynamic demonstration module and code implementation of the platform's main functional modules using C++ language. Finally, this paper formulates the test plan, designs the test cases, tests the platform, shows the test results and verifies the platform functions.