Tutorials and Applets for Teaching Basic Computer Science Concepts

University of Saskatchewan

Objectives for Innovation

Web-based instruction with Java applets

Intended Audience

Post-secondary computer science students

Results Achieved

Interactive web-based instruction in computer science

Interactive demonstrations of algorithms

Framework for using Java applets in other tutorials

Flexible access for students across the province and at the University of Saskatchewan

Partners

SIAST Kelsey Campus Computer Systems Technology Program

Implementation

September 1999

Program Web Site

http://www.cs.usask.ca/resources/tutorials/csconcepts/index.html

Additional Benefits

Available to the public

Used extensively by computer science students at the University of Saskatchewan and SIAST Kelsey Campus

Materials downloaded in many locations around the world

This program provides web-based resources on basic computer science concepts for teaching introductory post-secondary computer science courses. Online tutorials are enhanced by interactive Java applets. These are programs that run independently on a computer's web browser, allowing the user to interact with the material and see the dynamic display resulting from the interaction. Java applets can be used to illustrate complex relationships that change over time in response to the user's input.

Tutorials are designed to help students learn about stacks, queues, sorting, trees, searching, graphs and hashing. Algorithms, or step-by-step methods for solving problems, form the basis of computer programs that implement these concepts. Each involves physical events that change over time, such as sorting a set of objects. Students create and run computer programs, using Java applets, to see how the particular algorithm works and the effects of the main variables. Students experiment with the effect of different values on the algorithm and observe how key variables within the algorithm change.

Understanding algorithms is an important part of computer science. Students in introductory courses often find it difficult to determine the behaviour of algorithms by a process of analysis. They are more likely to understand when they can actually visualize what is happening with the algorithm as the computer program runs. Java applets enhance learning with simulation and experimentation.

Contact

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