

Learning C++ the Fun Way

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Introduction

Teaching students a new programming language is a challenging task. Students learn a language by writing programs in the language. Typical programming assignments often do not excite students to learn, but on the other hand, computer games attract many students to computer science. Games do not necessarily have to involve three dimensional and complicated graphics. Games could just be simple games that follow the saying “A minute to learn and lifetime to enjoy”. By allowing students the challenge of programming their own game, students are more apt to learn. This project involves constructing the infrastructure for allowing students to code and test their game implementations. The simple game used is called Critical Mass. The software developed allows students to play each other over the Internet, and a database of user information is used to track users’ performance and assign marks.

Motivation

Learning a programming language is often difficult to accomplish, but even a difficult subject is easier to learn by changing the method of learning. When a person actually participates in the learning process, then the process is more effective and productive. C++ is a widely known language to programmers and is introduced to students in their second year. Students are often intimidated by the amount of information that they have to learn. The most effective way to learn C++ is to code a program, which is achieved by an instructor giving students various assignments to work on. Students usually do not find assignments to be interesting. This project develops an instructional tool that allows for the construction of interesting assignments based on games.

Details

The GUI for this game is made using Java Swing. The core of the game will be written in C++. The web site graphics are written in Java. The web browser is linked to a Linux web server, which compiles code uploaded by students. Since the GUI of the game is written in Java and the core of the game is written in C++, a linking between the two is required.

The web interface allows students to upload code and challenge other students’ code. The game interface is a pre-written GUI. The students’ code can play each other, and the site tracks results of games and produces rankings of who has the best code. A MySQL database is used for storing student info, code and results.

Critical Mass is a simple game to understand. Basically, there is a 5 x 6 board of squares. Each square has circles. The squares in the corners have two circles each, the squares that outlines the board has three circles, and the squares in the center have four circles. When a user clicks on a square, one circle in that square will be filled. If all the circles are filled in a square, that square will “explode” (this square shall be called square A) and after the “explosion”, square A will have no circles filled. The squares that surround the square A (top, bottom, left, and right) will now have one more circle filled than it’s original state. If any of the surrounding squares are filled then that square will

explode as well therefore making a chain reaction possible. Players will continue adding pieces until all the enemy circles are gone.

Conclusion

Learning about a subject and making that process interesting is what the students want. Even when one has the capability to learn and understand the material, if the work becomes tedious then the process is hindered and less efficient. Developing a game such as Critical Mass and comparing the efficiency of the code to other classmates will encourage competition and the will to learn and be a better programmer. Developing a web site so that students' code can challenge each other is an efficient and fun way to encourage learning.