MIDWESTERN STATE UNIVERSITY

DEPARTMENT OF COMPUTER SCIENCE

CMPS 5153 – Advanced Software Engineering

Fall semester – 3 December, 2008

Final Report

Just tell me how you resolved bugs found in test report (see section 1,2)

Project: *Educational Discrete Math Interactive e-Learning Tutorial*

Version: *1.0*

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CS-6Squared SOFT SOFTWARE ENGINEERING

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1. Product Information

1.1. Current Status

Interactive e-learning tutorial is a creative web-based computer application particularly in the field of Computer Science, for the students who are taking Discrete Mathematics. This application meets all specifications mentioned in our Requirements document. The students will be able to get the explanation (observe how topic is explained) and also practice on the same topic. In addition, quizzes will be offered for each topic, so the students will be able to test their knowledge depending on the level of difficulty they select. Student will be able to observe animated mathematical solved problems. Additionally, this is an application that is very user-friendly, so students majoring in CS taking Discrete Math course will be able to use the application and understand the topics easily.

1.2 Known Defects

As shown in our Final Test Report, all of the errors found through our testing process have been documented, of which some still exist while others are corrected. which ones.

1.3 Future Development

If CS-6Squared were able to continue development of Interactive Learning System, we have some specific ideas that we would like to see implemented in future versions.

1.3.1 Make it web-based

Currently, Interactive learning system is a stand alone application. The user has to install it on the computer in order to use it. If given more time we would like to make it web based, so that user can access it from anywhere, either from the school or from home.

1.3.2 Include more tutorial topics

At present, eight Discrete Math tutorial topics are included. In future versions, we would like to add more topics, so that student can gain more knowledge about other topics.

1.3.3 Make it more secure

As this application is basically for the computer science students taking discrete math course, no other students are supposed to use this software. We can make it more secure by adding the feature of login, by setting the rights only to computer science students who have taken discrete math course, to access the application.

1.3.4 Refine quizzes

Currently, the quiz section is having the same questions for all the levels. If provided more time we can add different questions for different levels. Also, we would like to add the functionality of displaying the result at the end of each question, and display the correct answer if the answer selected by the user is incorrect.

2. Project Team Information

No single member of CS-6SQUARED can be credited with or discounted from the success of this project. It was a full team effort throughout the development process.
Team members of the project are: Devendar Reddy, Praveen Reddy, Rrezarta Krasnaqi, Rutu Chauhan, Sachin Yawalkar, and Sreya Reddy.

2.1 Team Structure

Adopting the democratic team structure, all the members of CS-6Squared contributed in every phase to accomplish the goals set forth throughout the development of the project. Each member came up with different, innovative ideas to make this project a success. According to the skills, portion of work was undertaken by every member in every phase.

2.2 Process Model Followed

Incremental process model is followed in order to develop the project. This consisted of five increments, originally scheduled to have deadlines an equal two weeks apart stretching over the time allowed for this project. Each increment was to have a prototype as an end result, which could be sent to the Testing team as the Implementation team continued development toward the next increment. The five increments were: Home page as well as subsequent linked pages, Java applets for tutorials, Quiz section, Entertainment/games, and Scientific calculator. This process model was chosen in the hopes that it would allow us to test and continue development concurrently, as well as have a concrete, semi-functional prototype (as an increment) which would be working at all stages of the process. This model worked well in the development of our project. As the schedule set, the implementation phase is completed on time, while the deployment phase will be completed well before the final presentation date.

2.3 Objective Team Points Distribution

The following point's distribution was presented to the group and agreed upon by the members of the CS-6Squared during the meeting held on 2nd December.

2.4 What CS-6Squared Learned

Throughout the course of this project, the members of CS-6Squared learned various aspects of software engineering project development, new software packages, the importance of teamwork in the development, and general background knowledge necessary for the development of Interactive Learning System.

2.4.1 Software Packages

Interactive learning system was developed using various software packages. Group members were familiar with some of the packages, while others needed time to learn. Design and development will be based on existing web based technology using JSP, servlets, XML, and integration of GUI interface using applets.

The basic software packages used are:

- Java 2 platform, standard Edition, v 1.4.2 (J2SE)
- Java Runtime environment (JRE) 6
- Oracle Containers for java EE (OC4J)- Oracle Application server
- Microsoft Access
- SVG Viewer
- Microsoft Visio
- Rational Software Architecture
- Internet Explorer, v 6.0
- ODBC

2.4.2 Team Work

As talented as the members of CS-6Squared may individually be, Interactive learning system is a project that has been developed within the given constraints by the team members. CS-6Squared owes the success of the project to the ability to work and function as a team. The weekly meetings, emails, and ability of the team members to function independently; all contributed to the development process. Everyone showed up in the weekly meetings, and took care of the timeline and the work to be done by the team members. This would not have been possible without the level of cooperation and communication exhibited within the team members. These all may seem intuitive, but for many of CS-6Squared's members, this was the first experience being part of a collaborative software development effort on this scale.

2.4.3 Background Knowledge

One necessity of this project was that the application must be interactive. For this, applets were needed to be implemented. In order to accomplish this, all the members of CS-6Squared were needed to be familiarized with the concepts of java applets. Apart from this, team members had to gain more in-depth understanding of the discrete mathematics topics in order to set up and implement the necessary mathematical functions within the application.

3. Looking Back

As the final delivery date arrives, CS-6Squared has been able to look back over the process and consider what would be changed, if the process were to begin a new now.

3.1 Software Life Cycle

Currently, proper software development life cycle was not followed. The implementation phase was started without completing the design phase. If we CS-6Squared have to start over again, we would have followed software development life cycle phases properly. Along with this, we would have performed more testing to make the application error free.

3.2 Familiarize Team Members with Software Tools Early

As noted in section 2.4.1 above, this project required the use of many new software tools by CS-6Squared team members. The team members would like to spend the early portion of the development cycle familiarizing themselves with the tools, in order to ease the stress of meeting deadlines while trying to learn new software as well.

3.3 What Worked Well

As stated previously, the success of this project was a team effort. Since it was a success, there are obviously portions of the process which we would not change were we given the opportunity to start the project now. The process model we chose to follow was a good choice for this project. The current increment, at whatever stage of the development cycle, was a concrete example of what we had accomplished to that point, and a visual reminder of what the team still needed to accomplish. The increments allowed us to have multiple operations ongoing in parallel, allowing each of the team members to constantly feel that they were contributing to the team effort. The weekly meetings, held in and out of class, were an essential part of the team's success. Allowing all team members to be briefly updated on what the other teams members were doing, offer feedback, and review deliverables helped keep the team from falling too far behind schedule. Another major part of the success of the project was allowing the team members themselves to choose to work in areas they were most interested or strongest in, reduced the learning curve necessary and allowed an easier path to a successful outcome.