Educational Video Game

"AstroQuiz"

Final Report

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Introduction:

Astroquiz is an education game designed to provide a fun way to learn new topics. The game is designed to throw random questions at the user during gameplay that they must answer in order to get a higher score. The game also allows the input of user questions and allows them to edit current questions. We used the incremental design process model which proved to be beneficial as we developed different features of the game which built on previous features.

Overview of Project:

Astroquiz was developed in several phases. First we determined what the specifications were for the program by getting all of the relevant information and wants of the customer. From there we developed a specification document detailing all of the specifications for the program. The primary goals of the program were to provide a fun educational experience with questions involving ACM Ethics as well as a way for the user to add or change questions.

The second phase of Astroquiz consisted of the planning phase. The team got together and developed a plan that took into consideration the required documentation that was needed for the program as well as developing the program itself. A timeline was developed and tasks were assigned to individual team members as well as a schedule of when tasks were due. This aided in keeping team members accountable and in providing a complete project by the due date.

The third phase was where we implemented our plan and developed the program. This phase took the longest and efforts from every team member was necessary. Major progress was completed prior to the due date and leading up to the due date minor changes and features were implemented but the core requirements were completed for the game. Throughout development testing was conducted by the team and errors were found and corrected as they appeared.

The final phase of Asteroquiz was the testing phase. The testing for the project was conducted by our testing team and consisted of searching for defects or errors while using the program. Several errors were found and corrected as well as a few errors that we were unable to find a solution to prior to the due date for this program.

Problems Detected and Solutions:

During testing a problem discovered was with the ability to change the type of ship you were using for the game. Even though the setting was changed inside the settings page it was

not reflecting on the game. After some searching for the code a solution was found by updating the ship which then reflected the change in the settings.

Another problem that was discovered involved changing the questions on the edit questions screen. When changing the question data in some fields the changes were not being reflected correctly. Simple changes to the way the saved data was displayed resulted in a solution to this problem

Deviations from Project Specification:

All major points in the project proposal and plan document were met with the exception of an upgrade system. While developing the game it was determined that an upgrade system would add unnecessary complication to the game for the user and the feature was dropped from development.

Minor changes were made to the challenge system in the game. Instead of a progressively more difficult gameplay and series of questions we decided to go with a straight forward difficulty level where all questions can be asked and if the player desires the difficulty of the game can be manually changed in the settings.

Known Problems:

There are only two known problems in the game at this time, one can majorly affect gameplay and the other is only a minor problem with entering questions. Multiple solutions were looked for solutions to the issues but none could be found or implemented during development or testing.

The most difficult problem we found occurs during gameplay and is caused when the ship is moving too fast. When the ship is traveling at its maximum speed toward an asteroid the collision can occur before the ship. A lot of time was spent by the development team to determine the cause of this error and find possible solutions and none could be found. A temporary solution to this problem is to slow down the ship speed from the current number 5 and reduce it down to 3 to reduce the collision distance of the ship and asteroids during unwanted collisions.

The second known problem is in the edit questions screen. When entering data that is too long to fit into the box formatting is not done correctly. The limitation is in the screen size and keeping the data readable to users. If too long of data input is entered it will go offscreen. These longer questions and answers can be solved by simply not making questions or answers too long in the game. Even if answers and questions go outside the size allotted in the edit questions screen, during gameplay often then questions will be properly displayed. A question shouldn't be more than a few sentences and an answer should not be more than one short sentence.

Changes if we had more time:

If there was more time available for the development of this program we would like to add more features in the settings to create a more user friendly experience as well as providing different assets for sound and images. We would also like to search deeper into the problems that we were unable to find a solution for and solve these problems in order to provide a polished product.

Differences if we did it all again:

If we had the chance to do this entire project again we would likely choose a different language for our game in order to improve performance and provide more control over certain aspects of the game. Overall we are satisfied with our product and would likely follow the same or similar course next time with exception to the language we developed in.

What we learned:

There were alot of learning opportunities during the development of this project. Many of us became more proficient with the python programming language as well as pygame which we used to develop this game. We also learned a lot about correctly documenting a software engineering project and we learned how to better work as a team in order to complete our project.

Summary

The development of Astro Quiz was a challenging endeavor for our team and provided us with multiple good learning opportunities. The finished product meets nearly all of our initial requirements that we expressed and includes many features that we think provide a good user experience. Astroquiz is a successful implementation of an educational game with the primary goal of educating players in ACM Ethics.