

COLOR SWITCH

AP FINAL PROJECT

This project is a JavaFX based application which implements the infamous game Color Switch. It is a high score game with various eye-catching components and competitive leaderboard making it highly addictive and dynamic.

The game is endless and gets more and more difficult with time until the user collides with an obstacle where the sole purpose of the player is to get as many stars as possible.

In order to keep the ball afloat, all a user has to do is to tap/click the mouse anywhere on the game screen. Using Physics concepts, Mathematics and integrating using our knowledge of Java, we were able to stimulate as if the ball has to fight gravity to stay afloat.

What makes the game further more dynamic is the ability to Pause the Game, Save It and Load it to continue from the saved state and Resurrect on having more than a threshold number of stars! [With a penalty of course 😊.]

TECHNICAL IMPLEMENTATION

- In terms of ground level implementation i.e. the source code, our application works in accordance to our UML and Use-Case Diagram. Implementation of essentials are as follows:
 1. To make the game endless, the pane background is set black and the obstacles move towards negative y-axis in relation to the position of the ball until the ball collides, thus giving us the notion of ball moving up which in reality is just obstacles moving down (relative motion.)
 2. The positioning of the stars has been kept absolute with the position of the obstacles, so they are stationary in relation to each other, but move in relation to the ball. Also, in Star.java, the overridden action function calls setScore from Main.java which is a method defined in Player.java, this keeps a count of the player score and updates it dynamically.
 3. Color Switches randomly allot one color out of the four to the ball and have been placed randomly throughout.
 4. So as to increase the difficulty of the game as it progresses, we have made changes in the size of obstacles, for example: the radius of circular obstacle decreases, hence the user has to time the click so as to not collide.
 5. Resurrection comes with a penalty! If a user wishes to resurrect on the basis of collected stars, then their score reduces by 20% or 1 point, whichever is feasible.
 6. Database is maintained to have four saved state slots, hence enabling the players to continue the game from where they left.

KEYS AND CONTROLS:

ALT -> Save Game and return to Main page

ESC -> Exit and return to Main page

Any Other Key -> Pause the Game

DIVISION OF LABOR

- **Saurav Rao (2019271):**

UML, fxml layouts, Collisions, Color Switches and Ball, Resurrection, Saved States and its corresponding Database, Error Handling, and Bonus of different Ball Types.

- **Aashish Malhotra (2019223):**

Use Case Diagram, CSS and fxml layouts, Main page and its beautification and formatting (GUI), Endless Pane and Obstacle Movement, Stars and Points Calculation, Bonus of adding gameplay music, and PPT.

BONUS COMPONENT

- We have added additional components to our application so as to enhance the feel of the game in terms of functionality, user experience and looks. The additional components are listed as follows:
- GUI:
 1. For looks and beautification of the application, we have made curved edges to the application with continuous color transition across the edges, the options also change color orientation when mouse hovers over a button.
 2. We have added in-game music which definitely enhances user experience and not just that, we have also added a button on the Main page to handover the control in player's hand to decide whether he/she needs the music or not.

Game functionality:

We have added a store option from which the user may select the type of ball or shape of object that he/she wants play with. Users have options to play with ball, triangle and even dice.

P.S: For all the competitive gamers out there, if you play with a dice, you earn double the points compared to a ball whereas triangles get you three times the points!!! ;)