Color Switch Clone – AP Final Project

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Game Components and Features

- ❑ 6 different obstacles with varying difficulty
- ❑ 4 colors with each obstacle having all 4 of them.
- ❑ Color Changers and Stars to make the game more fun to play.
- ❑ Beautiful User Interface with animations in all segments of the game.
- ❑ Endless game with no dead ends.
- ❑ Save and Load feature using serialization and deserialization.
- ❑ Displaying Score, Best-Score and Level to make it more engaging.
- ❑ An option to Continue a lost game using Stars.
- ❑ Difficulty increases with every 3 obstacles crossed by the player.
- ❑ Easy to comprehend menus.
- ❑ No exceptions in game play, handled using try and catch.
- ❑ Structure/functions according to the use case and class diagram provided
- ❑ Pause at any time during the game and then save or resume.

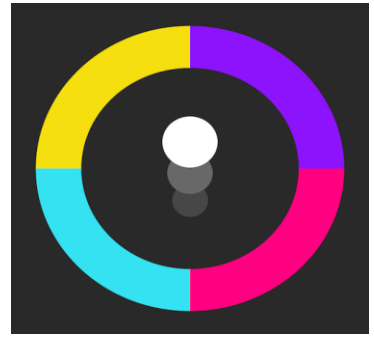
Design Components

- ❑ Fluid Animations.
- ❑ Timelines for all movements in the game.
- ❑ Sound for Level up, Game over and Star Collection.
- ❑ Image of star and Game logo added in the game.
- ❑ Color full Menus and Labels.

Instructions for playing

- ❑ Press Enter or use Mouse click to select menu options.
- ❑ Press Tab or use Mouse to switch among menu options.
- ❑ Press Enter or Space to Jump during the game.
- ❑ Press the key ‘P’ to pause the game at any point.
- ❑ You can choose to save the game once paused.
- ❑ You can continue a lost game using collected stars.
- ❑ Difficulty increases with Levels so keep up with it.

Problems and Solutions / Implementation



- ❑ Collision Detection: Done by using intersect function in Shape class.
- ❑ Continuous movement of all components: Done by using Timelines
- ❑ Moving The ball up endlessly: Done by shifting the pane down when ball moves above the half of the screen.
- ❑ Saving and Loading: Done by serialization and deserialization
- ❑ Rotating Obstacles**:** Using sin and cos formulas to arrive at a way to rotate and store their information at the same time.
- ❑ Endless obstacles, stars and color changers: By using Arraylist as a queue with updates at a fixed interval of time.
- ❑ Managing versions and parallel working of team members**:** Using GitHub for version control and making frequent commits and pushes to the repository.
- ❑ Managing so many classes and large code base**:** Using concepts of Object Oriented Programming and doing as less hard coding as possible.
- ❑ Not knowing how to do something**:** JavaFX documentation/ class notes and YouTube tutorials.
- ❑ Handling non-serializable components**:** Storing relevant information/ properties of the obstacle/star/color-changers/player that can be used to re-construct them with same orientation and rotation state.

Individual Effort

Priyansh Agarwal

- ❑ Making 4 obstacles and stars
- ❑ Implementing sound in the game
- ❑ Serialization and Deserialization
- ❑ Moving the Rotating Obstacles.
- ❑ Collision Detection and Game flow management.
- ❑ Class Diagram
- ❑ Managing in-game animations.
- ❑ Complete Error and Exception Handling.
- ❑ Managing Lag in the game and fixing all such cases.
- ❑ Power point presentation.

Moksh Aggarwal

- ❑ Making 2 obstacles, color changers, player
- ❑ Managing Menus and their animations.
- ❑ Complete Testing and Error Reporting.
- ❑ Moving the Linearly Moving Obstacles.
- ❑ Use Case Diagram
- ❑ Implementing endless game mode.
- ❑ Initializing the non-serializable components.
- ❑ Improving the UI and in-game experience.

Bonus Components

- Although the difficulty increases by increasing the speed of the obstacle, we have added another way to make it more interesting and hard to play: 1) The stars also move from left to right and vice versa after level 2 so that it becomes even more difficult to take them. 2) The player's ball starts fading with time when he reaches a level greater than 3, this way it becomes even harder to concentrate as the player must remember the ball color in order to know which place to move from in an obstacle. The ball color pops up every now and then for the user to revise the color.
- We have also added sound to the various sections of our game. For example: Level up, Game over and Star collection.
- We have added a very cool animation in our pause menu which allows the player to continue the game only while the timer does not go off. The timer is animated as it is done in games like Temple Run, by making a custom circular progress bar. The pause menu also has a custom alert dialog to tell the user why they cannot continue an ended game with proper reason in case they are not able to continue a saved game for reasons like: not enough stars.
- When user continues an ended game, the ball color is changed to white so that it can pass the obstacle it collided with. This way the game looks more like a real endless game as we don't get unnecessary collisions just after the ended game has been continued.