**Final Project**

**ColorCode - Color Matching Game**

**Submitted By**

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**Organizer University:** Jagannath University **Venue:** International University of Business, Agriculture and Technology (IUBAT) **Dept./Institute/Centre:** Computer Science and Engineering (CSE) **Unique Batch Number:** 03 **Training Track/Course Name:** Front-End Development (ReactJS)

**Project Description: Color Catcher - Reflex Game**

**1. Project Overview**

**ColorCode**  is an engaging, interactive, and reflex-based mini-game that tests players' reaction times and ability to focus. The objective of the game is simple: catch the correct colored ball using a movable basket. Balls of different colors fall from the top of the screen, and players must move the basket left or right to catch the matching color. The game increases in difficulty over time, with faster falling balls and a limited time to score as many points as possible.

**2. Project Objective**

The goal of this project is to create an exciting, fast-paced reflex game that is easy to play but difficult to master. Players will enjoy a simple yet challenging experience while improving their reaction time and focusing skills. The game will feature a clean user interface, simple mechanics, and a competitive edge with score tracking.

**3. Features**

1. **Player-controlled Basket:**
   * The player can move a basket left or right using the arrow keys or mouse to catch falling balls.
2. **Falling Colored circle:**
   * Balls of various colors fall from the top of the screen at random intervals, and the player must catch the ball that matches the target color.
3. **Target Color Display:**
   * A target color is displayed somewhere on the screen, and players must catch the falling ball of that specific color to score points.
4. **Score System:**
   * The score increases when the player catches the correct color and decreases when the wrong color is caught.
   * The score will be displayed on the screen.
5. **Timer:**
   * A countdown timer will be displayed, limiting the game duration.
   * The game ends when the timer runs out.
6. **Game Over Screen:**
   * When the game ends, a message with the final score will be displayed, and the player can restart the game.
7. **Increasing Difficulty:**
   * As the game progresses, the speed and frequency of falling balls will increase, making the game progressively harder.

**4. Technical Details**

**Frontend Development:**

* **HTML5**: Structure the game, creating necessary elements like the game area, basket, falling balls, score, and timer.
* **CSS3**: Style the game interface, creating animations for falling balls, the basket’s movement, and transitions.
* **JavaScript (ES6)**: Implement the game logic, including ball creation, fall animation, score tracking, and collision detection.

**Game Logic:**

* **Ball Movement**: Balls fall from the top of the screen, and their speed will gradually increase as time progresses.
* **Player Interaction**: The player can control the basket's movement with either keyboard or mouse input. The game will detect when the basket catches a ball.
* **Score Tracking**: The game will keep track of the player’s score based on the correct or incorrect balls caught.
* **Timer**: A countdown timer will track how long the game lasts, and it will stop when the timer reaches zero.

**UI Elements:**

* **Target Color**: Display the target color on the screen for players to identify which color ball they should catch.
* **Game Area**: The area where the balls fall and the basket moves.
* **Score Display**: A real-time score counter showing the number of correct balls caught.
* **Timer Display**: A countdown timer indicating the remaining time.

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**5. Future Improvements**

* **Multiple Levels**: Implement levels that introduce new challenges, such as more colors or obstacles.
* **Leaderboard**: Allow users to view a leaderboard of the highest scores.
* **Power-ups**: Add power-ups that appear occasionally to slow down the balls, add extra time, or provide bonus points.
* **Sound Effects**: Add audio feedback for catching balls, making a wrong move, and game-over events.
* **Theme Variations**: Offer different visual themes for the game, such as seasonal themes (e.g., Halloween, Christmas, etc.).

**6. Conclusion**

The **Color Code** game is a fun, engaging reflex-based game that provides users with a simple yet challenging experience. By implementing core web development technologies such as HTML, CSS, and JavaScript, this game will help players improve their reflexes while providing an enjoyable and visually appealing interface. With a simple premise and increasing difficulty, **Color code** will be an exciting addition to any web game collection.

This project will be fully responsive, ensuring accessibility for a wide range of devices. Furthermore, additional features and improvements can be added over time, making the game more enjoyable and competitive for users.