Project Report: Whack-a-Mole Game

# 1. Project Title

Whack-a-Mole: A Web-Based Reaction Game Using HTML, CSS, and JavaScript

# 2. Introduction

The purpose of this project is to design and implement an interactive browser-based game inspired by the classic arcade game Whack-a-Mole. The game tests the user's reflexes by requiring them to "whack" a mole that appears randomly on a 3x3 grid. This game serves as a beginner-friendly demonstration of web development using core front-end technologies: HTML, CSS, and JavaScript.

# 3. Objective

- Create an engaging and responsive web game.  
- Implement random animations and time-based interactivity.  
- Apply an appropriate software development model suitable for small-scale web-based games.

# 4. Technologies Used

|  |  |
| --- | --- |
| Technology | Purpose |
| HTML | Structure of the game |
| CSS | Styling and layout |
| JavaScript | Game logic and interactivity |
| LocalStorage | Store high scores |
| Audio API | Sound effects |

# 5. Development Model Used: Iterative Development Model

The Iterative Development Model was chosen because it supports:  
- Rapid prototyping  
- Frequent testing and feedback  
- Incremental feature additions  
- Early visualization of the product  
  
This approach allowed features like scoring, timers, difficulty settings, and sound effects to be added and tested in small iterations, ensuring that bugs could be fixed early and features refined based on feedback.

# 6. Phases of Iterative Development

## Iteration 1: Basic Game Structure

- Created HTML layout with a 3x3 grid.  
- Designed a scoreboard and start button.  
- CSS used for visual styling.

## Iteration 2: Game Logic

- JavaScript added for random mole popping using setInterval().  
- Click detection and score increment implemented.

## Iteration 3: Timer and Game Over

- Countdown timer added.  
- Game ends after 30 seconds with alert box.

## Iteration 4: UI Enhancements

- CSS transitions and colors added for better visuals.  
- Responsive design using media queries.

## Iteration 5: Advanced Features

- Difficulty selection (Easy, Medium, Hard).  
- Sound effects on mole hit and game over.  
- High score tracking using localStorage.

# 7. Key Features

|  |  |
| --- | --- |
| Feature | Description |
| Grid Layout | 3x3 clickable holes |
| Random Moles | Moles appear randomly every few milliseconds |
| Score Tracking | Points increase on successful clicks |
| Timer | Game ends after 30 seconds |
| Difficulty | Easy (1000ms), Medium (700ms), Hard (400ms) |
| Sound Effects | Feedback for clicks and game over |
| High Score | Stored using localStorage |
| Responsive UI | Works on desktops and mobile devices |

# 8. Screenshot

\*(Attach the static UI mockup image here in your final document.)\*

# 9. Conclusion

Using the Iterative Development Model, we successfully built a fully functional and responsive Whack-a-Mole game. This model allowed us to maintain flexibility throughout development, test features early, and continuously improve the user experience.

# 10. Future Enhancements

- Add leaderboard with backend integration.  
- Introduce multiple levels or stages.  
- Use character animations or sprites.  
- Add accessibility features (e.g., keyboard support).