Chapters

Overview

1.1 Introduction

The Tic-Tac-Toe Game is a classic two-player game, implemented as a web-based application using HTML, CSS, and JavaScript. The game allows the user to compete against a computer opponent on a 3x3 grid, where the goal is to place three of their marks in a row to win. This project demonstrates basic frontend development skills, with particular emphasis on user interaction, game logic, and responsive design.

1.2 Significance

This project showcases practical knowledge of JavaScript for handling game logic, dynamic interaction through DOM manipulation, and event handling. It also highlights the use of CSS for creating a responsive design, ensuring optimal user experience across various devices.

Problem Definition

2.1 Problem Statement

The project aims to develop a simple Tic-Tac-Toe game where the user competes against a computer. The game should:

- Allow the user to choose their mark (X or O).
- Randomly assign a mark to the computer and alternate turns.
- Determine the winner based on the Tic-Tac-Toe rules (three identical marks in a row, column, or diagonal).
- Provide a simple user interface that is responsive and interactive.

Proposed Work

3.1 Creation of Functions

Instead of object-oriented programming, the game logic is split into various JavaScript functions to handle gameplay. These functions include handling user moves, updating the board, checking for wins or draws, and resetting the game.

3.2 Tools Used

- HTML: For the structure of the game (grid layout, buttons).
- CSS: For styling the grid, making it visually appealing, and ensuring responsiveness across devices.
- JavaScript: For the core game logic, handling player and computer moves, and interacting with the DOM.

3.3 Algorithm

1. User Input: The user selects a grid cell to place their mark.
2. Computer Turn: The computer makes a random move after the player’s turn.
3. Result Calculation: After each turn, the game checks for a win condition (three in a row, column, or diagonal) or a draw if all cells are filled.
4. Display Results: The game declares a winner or draw and updates the score.
5. Repeat: The game restarts upon user input to play again.

Analysis and Planning

4.1 Analysis and Planning

The planning phase involved designing the game's flow, ensuring a smooth transition between player and computer turns, and implementing game-ending conditions. Key aspects included:

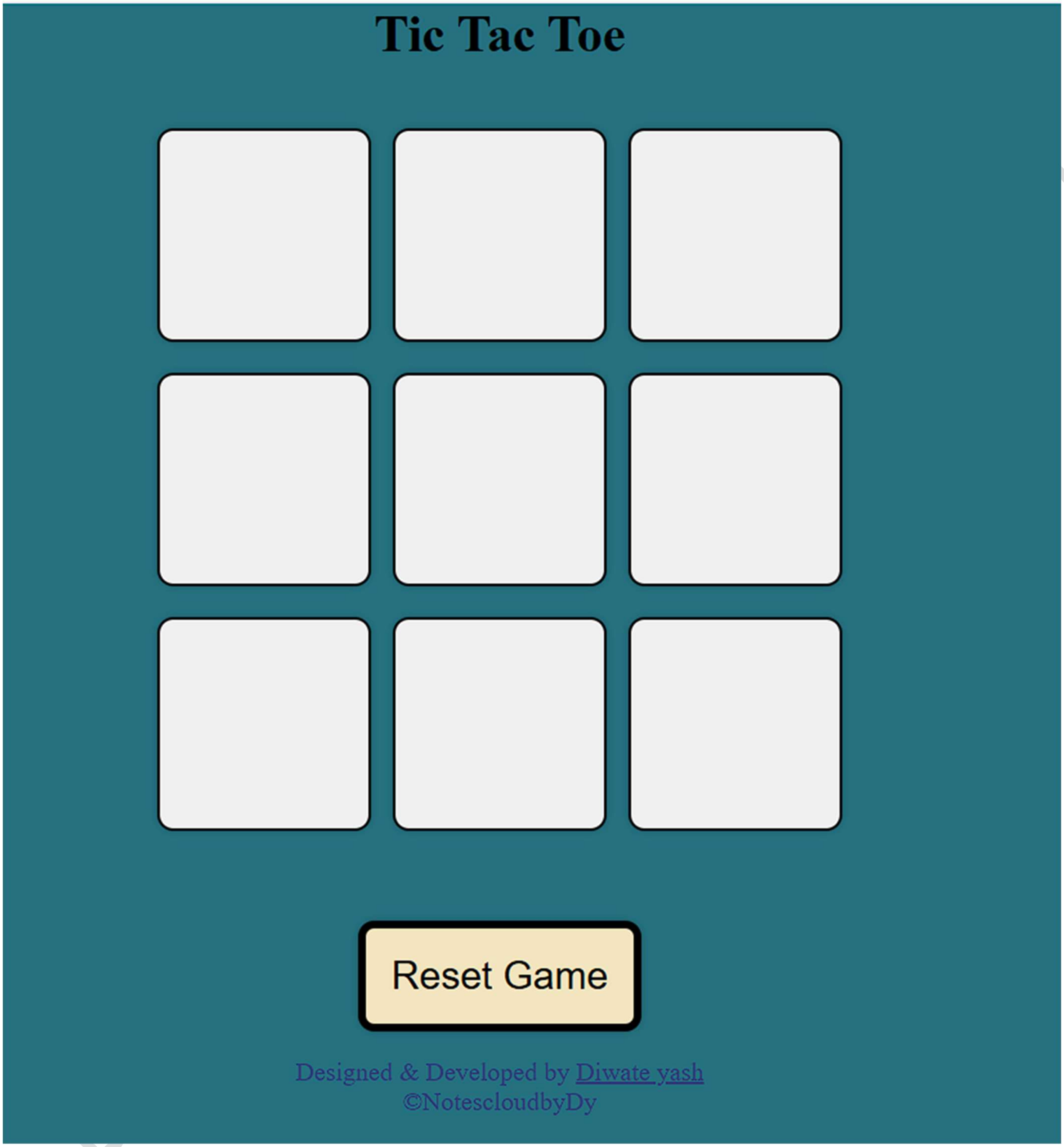
- Ensuring the game is interactive and responsive on all device sizes.
- Using basic game logic to ensure fair and random computer moves.
- Structuring the code to allow for easy maintenance and possible future enhancements.

5) Results

5.1 Snapshots of Project

This section provides visual documentation of the game:

- Homepage: Shows the Tic-Tac-Toe grid and start/reset buttons.
- Game Interface: Displays the player’s and computer’s moves, along with the result (win, lose, or draw).
- Responsive Design: Screenshots of the game running on desktop and mobile devices, showing how the grid adjusts to different screen sizes.



Tic Tac Toe

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6) Future Enhancements and Future Scope of Project

6.1 Future Scope

The project has scope for future enhancements, including:

- **AI Improvements**: Implementing more advanced algorithms for the computer’s moves, such as the Minimax algorithm, to make the game more challenging.
- **Multiplayer Mode**: Allowing two players to play on the same device.
- **Animations**: Adding visual animations to enhance the user experience when a player or computer makes a move.
- **Sound Effects**: Adding sound for moves, wins, and draws.
- **Scoreboard**: Maintaining a scoreboard that tracks the number of wins, losses, and draws over multiple sessions.

7) Conclusion

7.1 Conclusion

The Tic-Tac-Toe project effectively demonstrates fundamental web development concepts such as dynamic interaction using JavaScript, building an intuitive user interface with HTML and CSS, and implementing game logic. The project successfully fulfills the goal of creating a simple, yet engaging, web-based Tic-Tac-Toe game and provides a foundation for further development, including enhanced AI and additional gameplay features.