ENHANCING DIGITAL GOVERNMENT AND ECONOMY
Digital Skills for Students

Final Project

Memory Card Game

Submitted By

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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: Memory Card Game

1. Project Overview

The **Memory Card Game** is a classic, brain-stimulating card-matching game designed to enhance short-term memory and concentration. Players are presented with a grid of face-down cards, and they must flip over two cards at a time to find matching pairs. The goal is to match all pairs in the least number of moves and as quickly as possible.

2. Project Objective

The objective of this project is to create an interactive and visually appealing memory-based game using core web technologies. The game helps improve cognitive skills by challenging the player's memory and pattern recognition abilities in a fun and engaging way.

3. Features

1. **Card Grid Layout:** A 4×3 grid of face-down cards that flip to reveal images when clicked.
2. **Matching Logic:** Players flip two cards at a time; matching pairs stay face-up, while non-matching pairs flip back.
3. **Move Counter:** Tracks the number of flips (attempts) made by the player.
4. **Timer:** Counts down from 60 seconds, with game-over triggered when time expires.
5. **Win/Lose Popups:**
   - ✓ **Win Popup:** Appears when all pairs are matched, showing total time and flips.
   - ✓ **Time's Up Popup:** Appears when the timer reaches zero, showing progress.
6. **Responsive Design:** Adapts to mobile and desktop screens with media queries.
7. **Animations:** Smooth card-flip and shake effects for mismatches.
8. **Reset Functionality:** Refresh button to restart the game at any time.

4. Technical Details

Frontend Development:

- **HTML5:** Structured the game board, cards, and UI elements.
- **CSS3:** Styled cards, animations (flip/shake), and responsive layouts.
- **JavaScript (ES6):** Implemented game logic:
  - ✓ Card shuffling and matching
  - ✓ Timer and move counter
  - ✓ Win/lose condition handling

Game Logic:

- **Card Setup:** 12 cards (6 pairs) shuffled randomly on load/reset.
- **Flip Animation:** CSS transforms for 3D-like card flipping.
- **Match Checking:** Compares image sources of flipped cards.
- **State Management:** Tracks flipped cards, matches, and game status.

UI Elements:

- **Header:** Game title ("Memorize").
- **Stats Panel:** Displays time remaining and flip count.
- **Cards:** Visual elements with consistent sizing and hover effects.
- **Popups:** Modal dialogs for game outcomes with replay options.

5. Future Improvements

1. **Leaderboard:** Save high scores using local Storage.
2. **Themes:** Custom card sets (animals, flags, etc.).
3. **Difficulty Levels:** Adjustable grid sizes (e.g., 4×4, 6×6).
4. **Audio Effects:** Sound for flips, matches, and game end.
5. **Multiplayer Mode:** Turn-based competition.

6. Conclusion

This Memory Card Game demonstrates core front-end development skills with HTML, CSS, and JavaScript. It provides a responsive, interactive experience that challenges memory and focus. The project serves as a foundation for future enhancements, such as advanced scoring systems or multiplayer functionality.

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.