AI Game Title:- "Word Chain AI Game."

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1. Introduction :

The **Word Chain AI Game** is a vocabulary-based linguistic game where the player and an AI opponent alternately provide English words. Each new word must begin with the **last letter** of the previous word, forming a continuous "chain."

This game combines **vocabulary skills, time-based decision-making,** and **AI-driven strategic responses**. It is designed to be simple, engaging, and educational, making it suitable for players of all ages.

2. System Overview :

The system follows a **client–server architecture** with a lightweight backend and an interactive frontend.

I. Backend :

● Delivers the game interface to the browser
● Provides a static "highscores" API endpoint
● Does **not** process any game logic
● Maintains a minimal, fast, and stateless structure.

II. Frontend :

The entire game logic runs in the browser, including:

● UI rendering

- Word validation

- Timer control

- AI decision-making

- Level management

- Achievements

- Word Journal

- Local data persistence.

The game behaves like a **modern single-page web application (SPA)**.

3. <u>Cross-Device Compatibility (Fully Responsive Design)</u> :

One of the major strengths of this game is that it is designed to be **fully responsive**, meaning it adapts automatically to different screen types and sizes.

The game interface is friendly and optimized for:

◆ **Mobile Phones (Android/iOS)**

- Touch-friendly buttons
- Large input fields
- Auto-scaling text
- Compact layout for small screens.

◆ **iPads & Tablets**

- Middle-sized responsive layout
- Balanced spacing
- Smooth transitions suitable for touch and pen input.

◆ **Laptops & Desktop Computers**

- Wide-screen layout
- Proper spacing and large content areas
- Keyboard and mouse optimized interactions.

4. <u>Gameplay Theory</u> :

1. Includes Start Screen, Level Select, Game Screen, Achievements, Word Journal
2. Player selects level → gets starting letter → enters valid word

3. AI replies with a valid chained word

4. Ends when: no word, invalid word, duplicate, or timeout

5. Higher levels: less time, smarter AI, stricter rules.

5. Word Validation Theory :

- Online API checks meaning, existence, correctness
- Offline fallback list used when no internet
- Ensures game works anywhere.

6. AI Decision Theory :

- AI picks words based on required starting letter
- Avoids dead ends
- Higher levels → deeper strategy.

7. Timer System :

- Countdown for every turn
- Higher levels = faster timer
- Timeout causes penalty or loss.

8. Scoring System :

- Rewards: valid words, speed, unique entries
- Penalties: invalid words, duplicates, timeouts.

9. Word Journal :

- Stores all words + meanings
- Helps vocabulary learning
- Works offline.

10. Offline Behavior :

- Game still playable
- Uses fallback validation
- Achievements and journal always available.

11. __UX & Visual Design__ :

- Neon UI, smooth animations, clean layout
- Fully responsive on mobile, iPad/tablet, laptop, desktop.

12. __Data Persistence__ :

- Uses local storage
- Saves progress, achievements, journal
- No external database → full privacy.

13. __Future Enhancements__ :

- Multiplayer, leaderboards
- Cloud sync, themes
- Stronger AI.

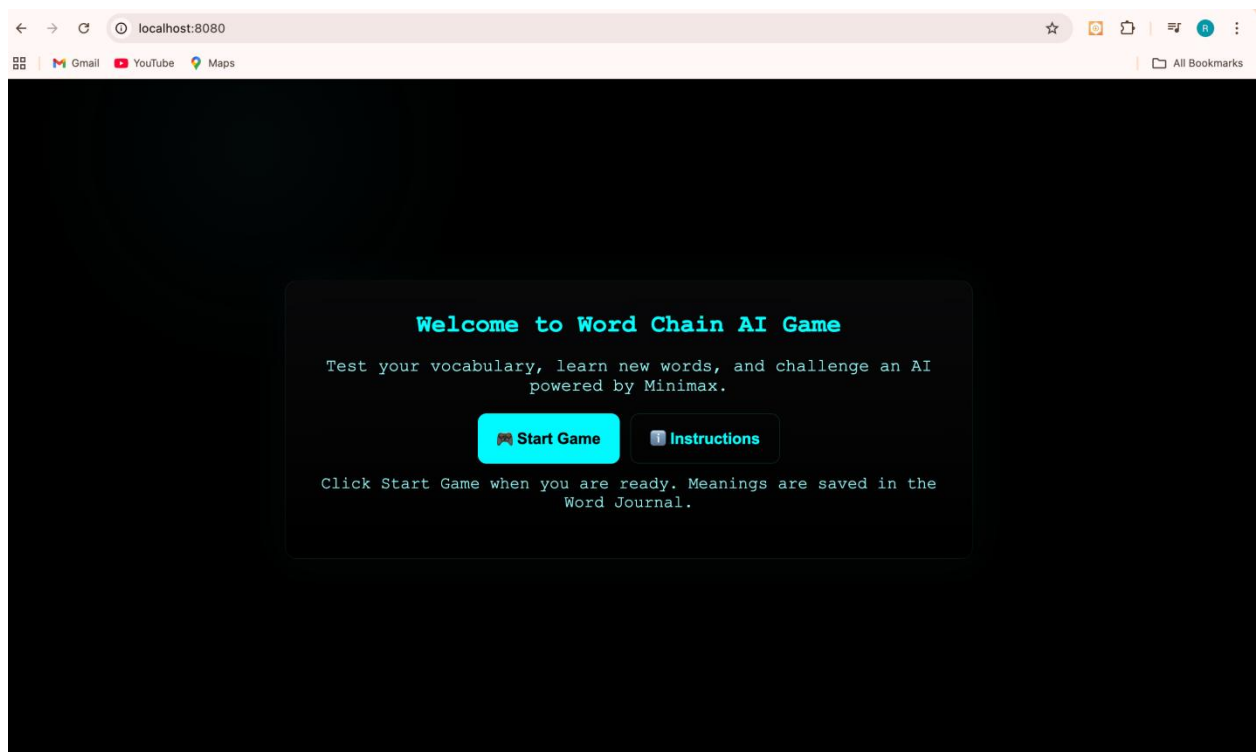## 14. __Implementation Images / Screenshots__ :

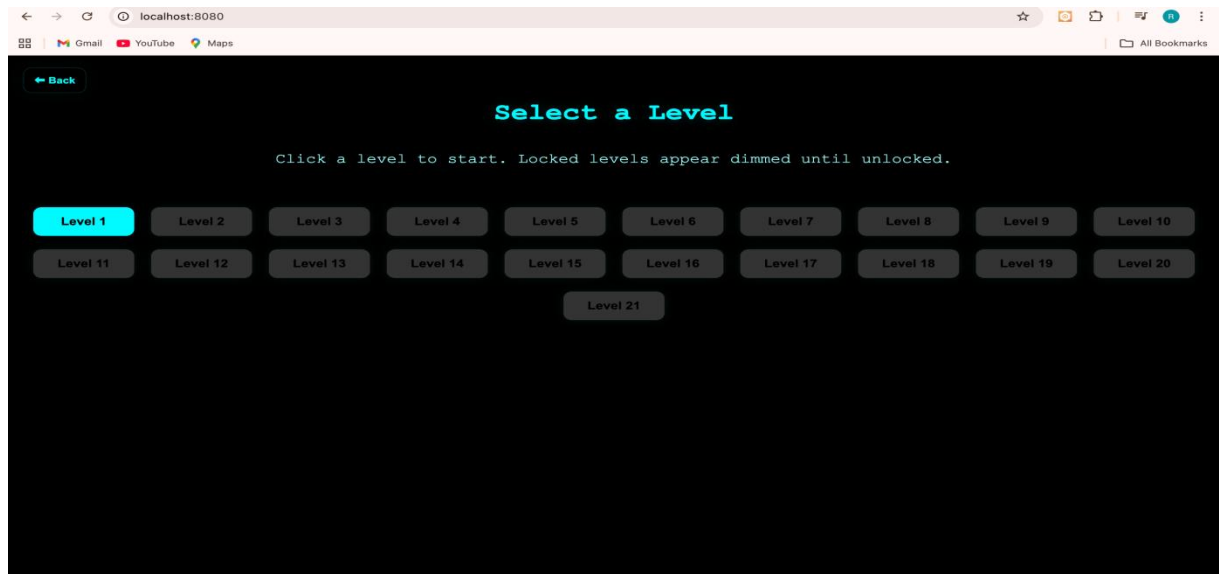Fig.1.1:- Desktop / Laptop View of Word Chain Game
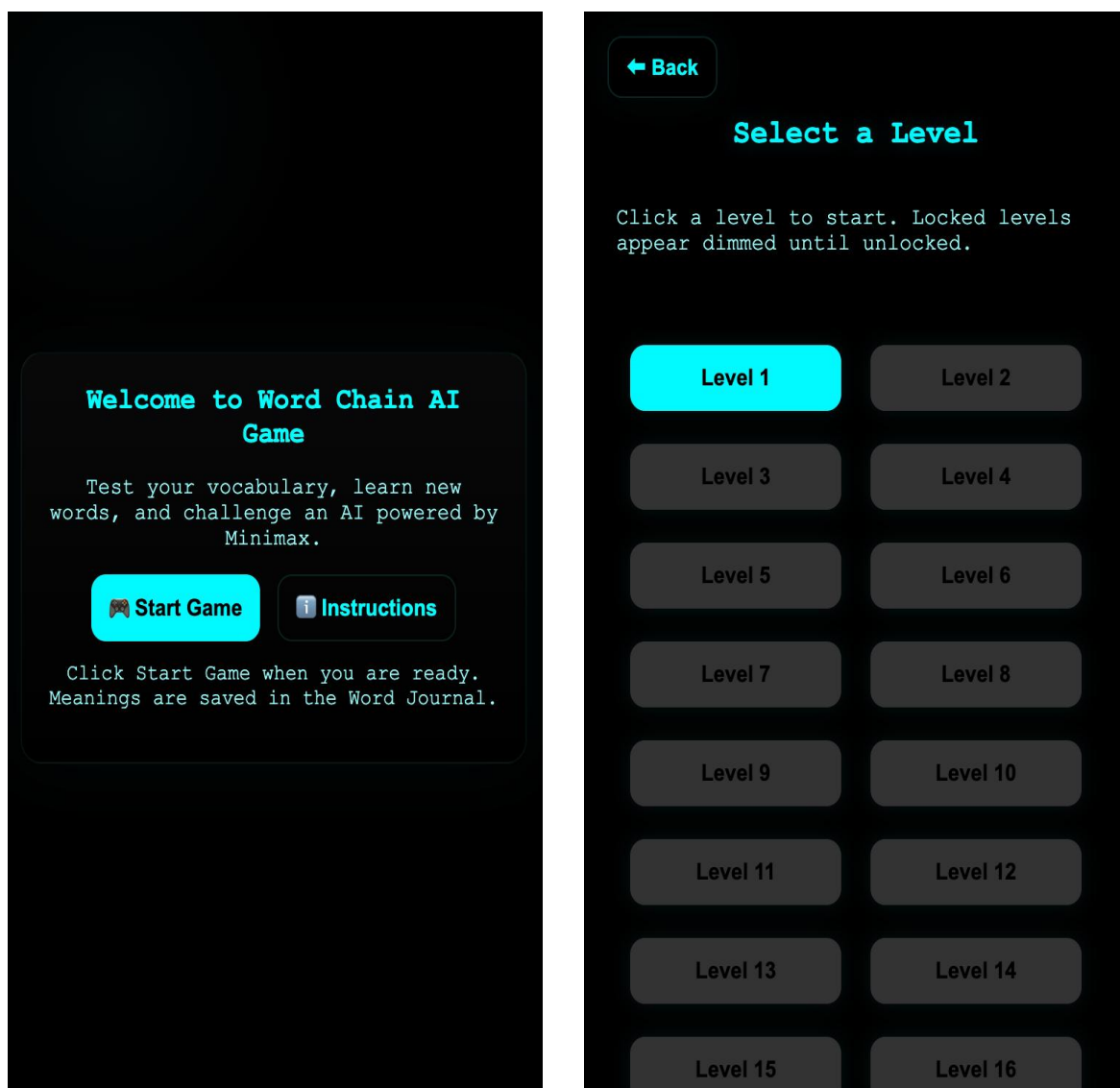
Fig.1.2:- Desktop / Laptop View of Levels in Game

Fig.2:- Mobile View of Word Chain Game and its Levels

15. Conclusion :

The Word Chain AI Game is a responsive and educational vocabulary challenge that uses a Minimax-based AI strategy to choose optimal words and avoid losing moves. It works smoothly across mobile devices, tablets, laptops, and desktops, offering a modern, smart, and fully accessible gameplay experience.