A Web-Based Game Site Proposal

RetroHub: Free Online Arcade

Course: COMP3421 Web Application Design and Development

Group Members and Roles:

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Abstract

This document outlines the proposal for a group project to design and implement a **Web-Based Classic Game Site**. The application will serve as a centralized platform for users to play simple, classic games such as Solitaire, Pacman, and Tetris. Key functionalities will include **user registration and login**, a **leaderboard system** to track high scores, and a customizable, intuitive **user interface** with multi-page navigation. The project will adhere to the requirements of the course by implementing both **client-side (frontend)** and **server-side (backend)** components, with a focus on a robust application logic and database management. The final deployment will target a real server (cloud or departmental) for extra credit. The project will be a two-member effort, with Daniel focusing on core backend architecture and game logic, and Louis focusing on the frontend design and API consumption. **Data handling, security, and the global high score system will be co-developed by both members.**

1   Introduction, Goals, and System Architecture

The project goal is to develop "RetroPlay," a fully functional, interactive web application hosting at least three popular classic mini-games (e.g., Solitaire, Tetris, Pacman). This platform will offer an engaging user experience and demonstrate proficiency in full-stack web development, specifically by integrating complex functionalities like real-time game state management, user authentication, and data persistence.

1.1   Project Scope and Core Features

The platform will support the following key functionalities, ensuring an achievable Minimal Viable Product (MVP) that adheres to course requirements:

F1. **Game Library:** Three classic mini-games playable directly within the application.

F2. **User Authentication:** Secure registration/login, including Guest Play where scores are not recorded.

F3. **Leaderboard System:** A global ranking system to display top scores for each game, linked to registered accounts.

F4. **Interactive UI:** Multi-page navigation structure (Home, Game Pages, Login, Leaderboard, Profile).

F5. **Customization:** User-level color theme selection, persistently stored for authenticated users.

1.2   System Architecture and Implementation

The application will employ a Client-Server Architecture utilizing modern frameworks for scalability and maintainability.

Client-Side (Frontend - Louis)   Louis will lead the frontend development, focusing on a responsive, intuitive UI/UX design using HTML5/CSS3 and a modern JavaScript framework/library (*to be confirmed*) for interactivity and state management. The Home page will feature a grid-based structure for game selection. While Louis manages the visual presentation and embedding, Daniel will implement the core JavaScript game mechanics (e.g., movement and collision logic) on the client side.

Server-Side (Backend - Daniel)   Daniel will lead the backend, focusing on application logic, security, and data management. The server will use a robust environment like Node.js with Express (*to be confirmed*) to host a RESTful API for client-server communication. A persistent database (**MongoDB or PostgreSQL**, *to be confirmed*) will store user data, scores, and settings. Both members will co-develop the database schema, security protocols, and validation logic for high scores and the Leaderboard.

2   Team Organization and Roles

The project will operate under a clear division of labor with integrated collaboration points to ensure high-quality output for both the user experience and the system's robustness.

Team Member and Role	Key Responsibilities and Collaboration Points
Daniel YEUNG Tsz Lok (*Backend Developer / Game Logic Lead*)	**Core Responsibilities:** ✓ Server-side architecture (Node.js/Express setup). ✓ Database management and query optimization. ✓ User authentication and session logic. ✓ Core Game Mechanics (Client-Side JavaScript logic).
	Collaborative Efforts (with Louis): ✓ Designing the API structure for data exchange. ✓ Implementing data collection and security for scores. ✓ Building and optimizing the World Record/Leaderboard functions.
Louis LUI Chun Hei (*Frontend Developer / UI/UX Lead*)	**Core Responsibilities:** ✓ Full UI/UX design and responsive styling (HTML/CSS). ✓ Multi-page structure and navigation implementation. ✓ Client-side API consumption (fetching data, submitting scores). ✓ Visual presentation and embedding of the games on the site.
	Collaborative Efforts (with Daniel): ✓ Ensuring the client-side adheres to the defined API structure. ✓ Implementing client-side security protocols for data transmission. ✓ Designing the dynamic Leaderboard display and user profile views.

3   Conclusion

The proposed Web-Based Classic Game Site is a comprehensive project that meets all the requirements of the course. The project plan, featuring a clear division of labor into distinct frontend and backend roles, ensures a systematic development process. The integration of core features like user authentication, data persistence via a leaderboard, and user customization will result in a web application that enables users to have quality, and at-ease game experience.