CART 351

Networks and Navigation

Project III Written Documentation

Title: *RONIN SHOWDOWN*

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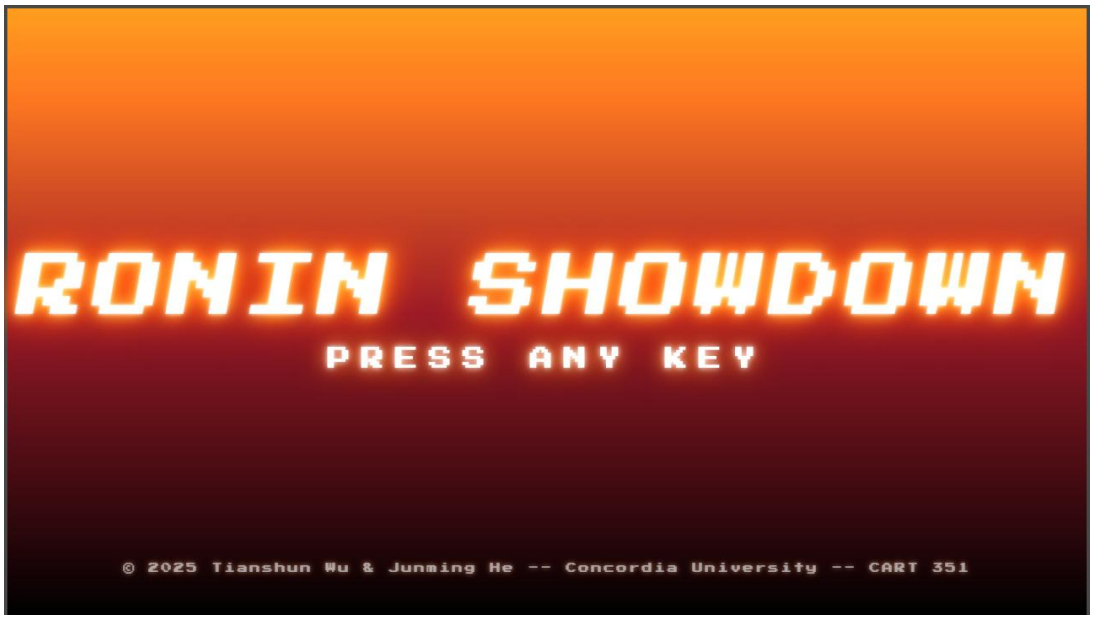
Course: CART 351 – Fall 2025
Class Time: Monday 1:15pm - 5:15pm
Location: EV 5.709, Sir George Williams Campus

Submission Date: December 7, 2025,

Introduction & Motivation

For this final project, we wanted to make something interactive, competitive, and a bit nostalgic. That's why we decided to build a small online fighting game in the style of old arcade titles. The idea came from our interest in virtual competition and how people behave differently when they are interacting through a networked space rather than face-to-face. A simple fighting game gave us a clear structure to explore that: two players enter the same space, make decisions quickly, and react to each other.

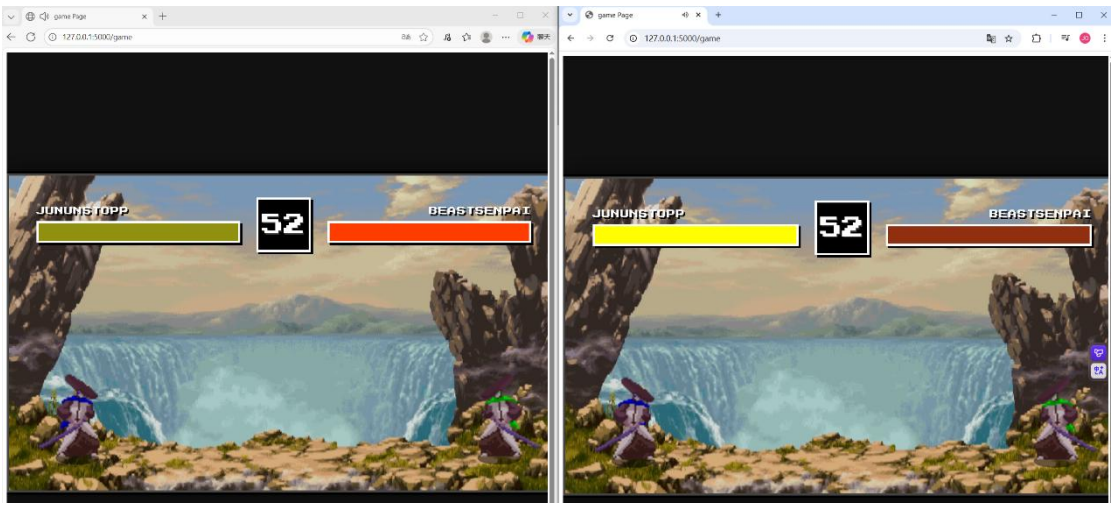


At the same time, we didn't want the game to exist only in the moment of play. Since our class focuses on networked data and state, we used this as an opportunity to let the game "remember" what happens. Every attack and round result is written into a MongoDB database. Over time, this creates a kind of history for the arena: which people win the most, which color players prefer, how often people win or lose. Even though the game looks retro, the system behind it is constantly updating and storing information.

The retro pixel aesthetic wasn't only for style; it helped give the project a clear identity and made the interface more fun to interact with. The look of old fighting games, bright

colors, bold text, quick flashes, fits well with a browser-based project and also makes the network interactions feel more playful. It also kept the scope manageable, since pixel visuals are easier to scale.

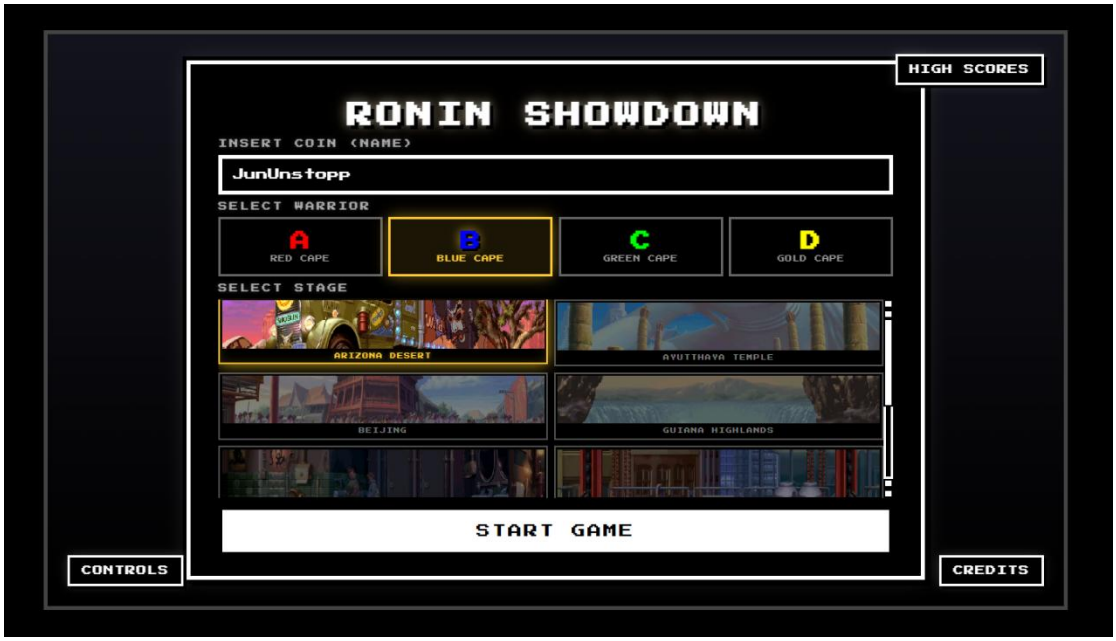
Overall, our motivation was to build an online space where competition becomes a shared experience. Two players can fight each other in real time, and their actions don't disappear, they contribute to the state of the whole system. This combination of arcade gameplay and networked data shaped the direction of the entire project.



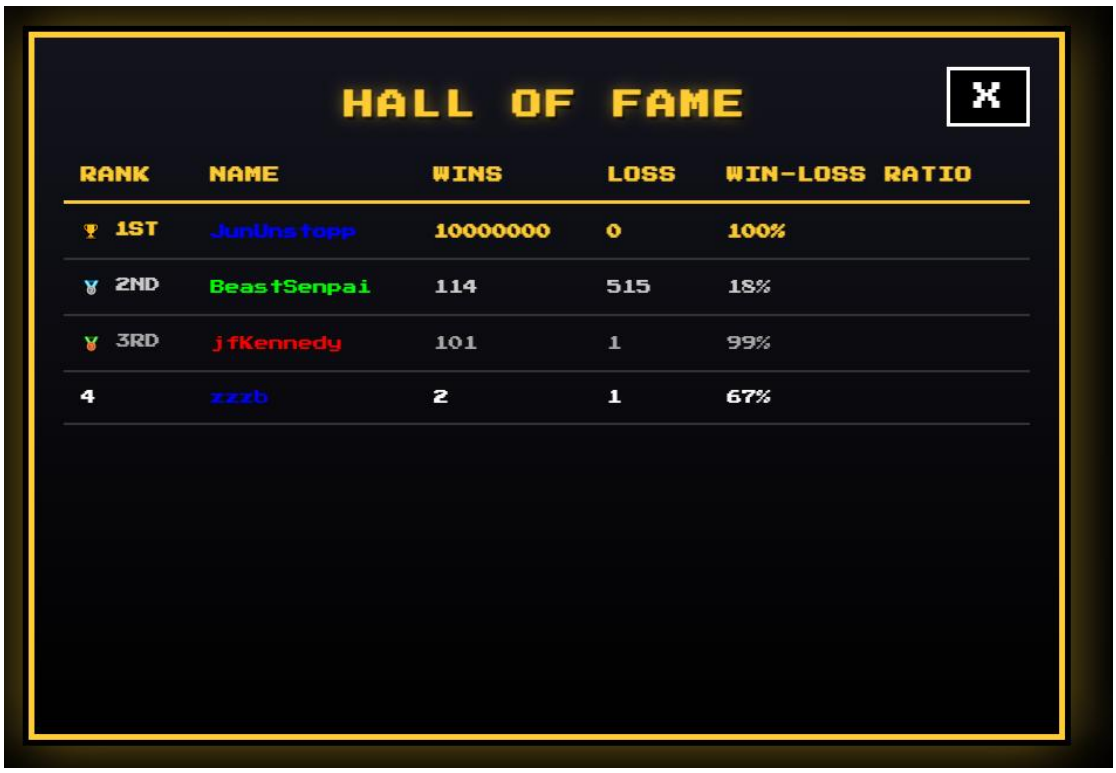
Intentions & Design Framework

When we began developing the project, one of our main goals was to make the interaction feel responsive and immediate. We wanted players to act and see results without noticeable delay, even though they were connecting through a network. With that priority in mind, we chose a one-on-one fighting format as the core structure of the game. This format keeps the pacing tight, and it also makes the synchronization requirements more manageable: only two players need to share positions, actions, and hit events, which helps maintain stability and timing during online play.

For the gameplay itself, we focused on keeping the rules and controls simple so that players could start playing quickly. On the webpage, joining the game only requires entering a name and selecting a color and a map. In the match, movement is limited to left and right, and attacks depend on distance and timing rather than complex combinations. Rounds are short, and the interface elements, such as health bars, direction indicators, and hit reactions were kept straightforward and readable. This approach ensures that players can immediately understand the situation on screen and react without hesitation.



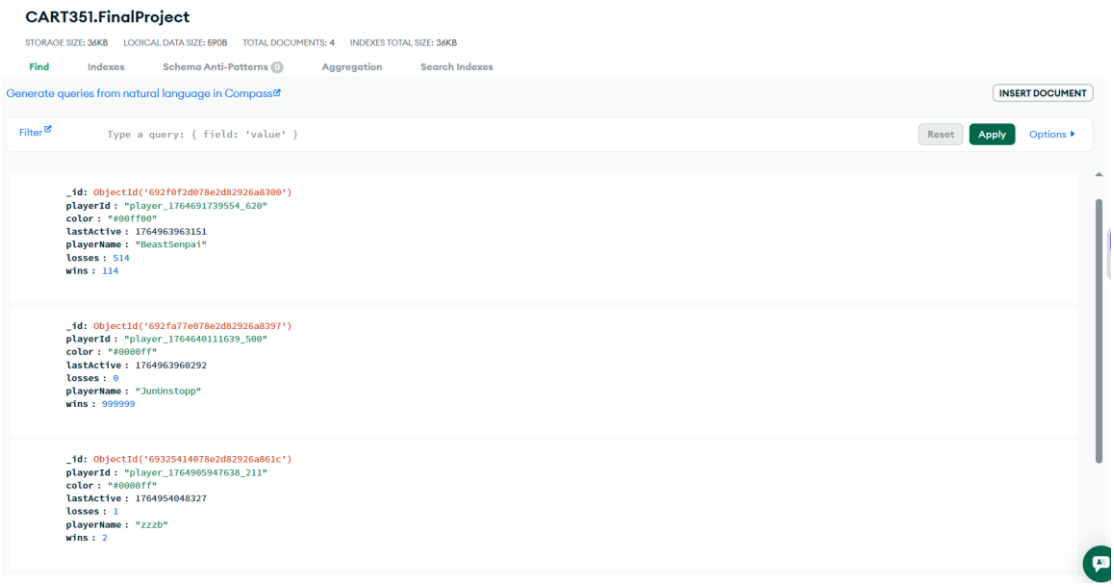
We also wanted each interaction to feel meaningful rather than disposable. To support that, we added a leaderboard system that tracks wins and losses over time. This creates a balance: each match is fast and temporary, but the data accumulates and gradually forms a record of participation. In this way, the game remains lightweight, while still giving players a sense of progression and continuity as they return and interact more with the system.



References & Resources

During development, we used classic arcade fighting games as a reference, especially for pacing, movement scale, and animation timing. Early Street Fighter titles helped us estimate values such as jump distance, movement speed, and frame counts. These references were useful not because we wanted to copy them directly, but because they helped us decide which mechanics were essential and which ones could be simplified based on our time and scope.

For the technical implementation, we used Flask to handle routing and serve the game interface, while Socket.IO managed real-time communication between players and the server. This combination allowed us to synchronize character actions, game state, and the match timer in a lightweight and browser-friendly way. MongoDB was used to store player data because it supports flexible and rapidly changing structures, making it easy to record and update player information as the game continues to run. Together, these tools provided a simple but effective framework for creating a responsive online experience with persistent data.



Practical resources also played a role in shaping the project. The main gameplay logic was adapted from the tutorial *JavaScript Fighting Game* by Morpheus Tutorials, which uses a simple vanilla JavaScript structure with clearly separated files. Even though the tutorial was not Flask-based, its organization made it easy to integrate with our server setup and helped us understand where networking code should be added. The character sprites were sourced from Luiz Melo on Itch.io, and the background stage is from the Street Fighter Alpha 2 video on YouTube, which allowed us to focus on real-time communication and game logic rather than producing custom artwork. These resources helped streamline development and kept the project manageable while still

giving it a recognizable style and complete gameplay loop.

Expected Outcomes & Reflection

We expect the game to offer a fast, easy-to-learn, and repeatable experience that players can quickly enter when they have a spare moment or want a short match with a friend. Since the controls are simple and each round is brief, players can begin playing immediately without preparation or a long learning curve. As more matches are played, the recorded results will gradually shape the leaderboard and give it a sense of ongoing activity. Over time, it will show familiar names, improvement rather than random one-time scores. This adds a small social dynamic to the experience and makes each match feel relevant to what came before. Instead of treating every game session as separate or temporary, the stored results create continuity. The experience becomes something players can return to, with previous matches still visible and meaningful, rather than starting from zero each time.

For us, the project is meaningful not only as a finished game, but also as an opportunity to further understand how real-time networking works from a game developer's perspective. While we had already learned the basics of front-end and back-end communication in class, building the game required us to apply those concepts in a real-time multiplayer context. Through development, we had to consider how data travels between players and the server, how timing affects interaction when multiple people share the same game state, and how these elements work together during live gameplay.

Throughout the process, we gained a clearer understanding of how multiplayer systems behave in practice. We encountered synchronization problems, timing issues, and unexpected bugs that do not appear in single-player environments. Solving these challenges helped us understand the differences between designing a single-player game and a multi-player game. Overall, the project gave us a more concrete and practical understanding of real-time network communication.

References (links)

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Fists Will Fly, at This Location. 2023. *YouTube video*, 2024. Uploaded by Fists Will Fly, at This Location. – stage for the game: https://www.youtube.com/watch?v=CKqDVIfAvJg.