CSC 337 (Fall 24): Web Programming

Final Project (Revised)

Online Game and Leaderboard

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1 Overview

Our overall goal for this project is to create an interactive website for users that are interested in video games and competing against other players. The vision for the website is to feel like a mix of old-school video game forums (think of speedrun.com) and web browser gaming sites (think of coolmathgames.com) but for the game we designed for our website. We have various pages you can navigate to with each serving their own purposes to help users understand the functionality of our webpage.

The features of the website we focused on the most are the social and interactable elements. We have a page where users can make attempts at our game and compete for the highest scores. This is accompanied by an additional webpage that will show high scores for all users that have played the game on the site. We have an area where users can interact with one another by leaving comments on the game and scores that others are achieving. We implemented these using techniques learned in class, and learned how to make a basic game using JavaScript.

2 Frontend

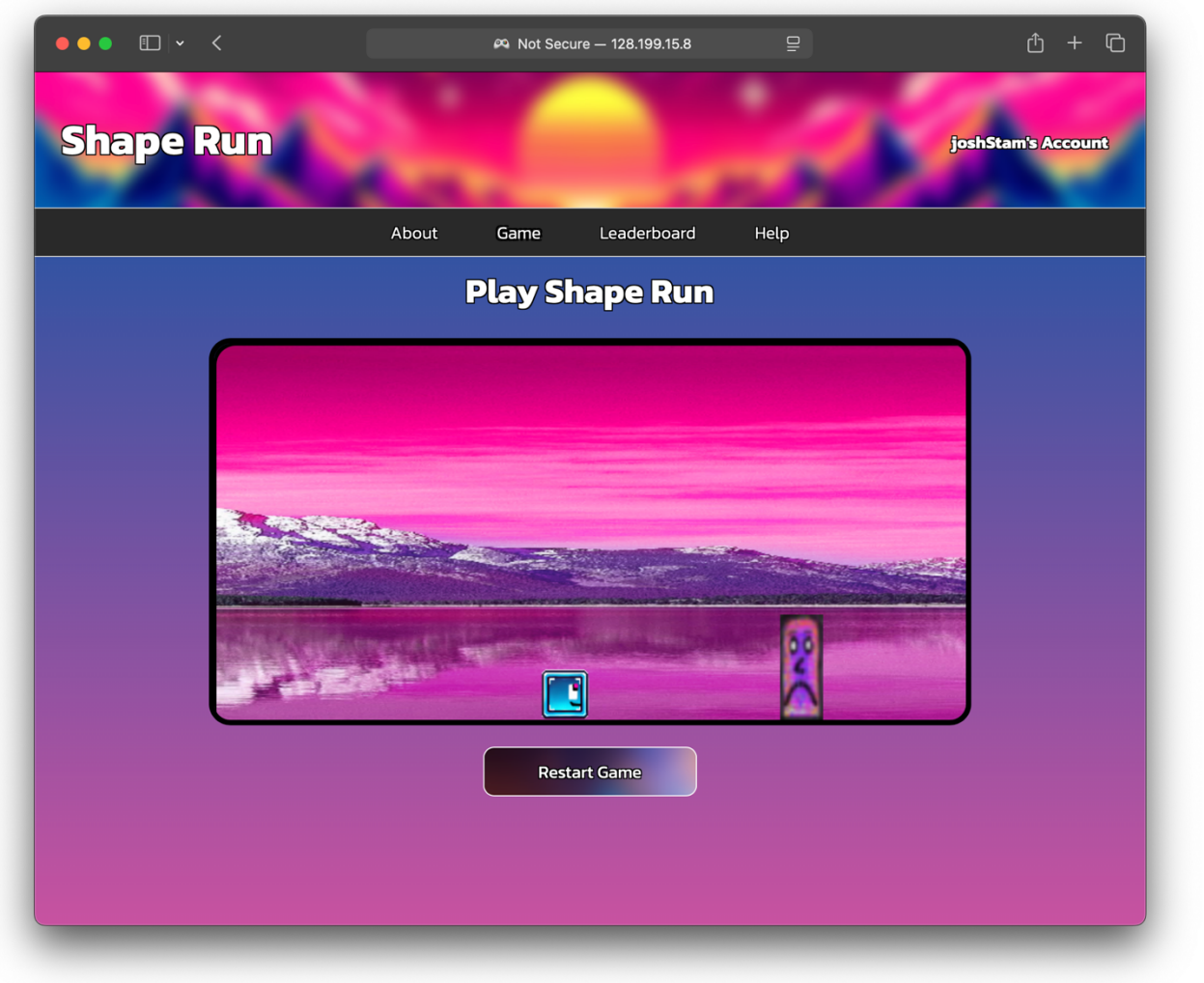
The frontend has a focus on four main areas:

2.1 – Login/Welcome Screen

The welcome screen is intended to be inviting, the login screen is intended to be simple. It prompts you with a brief welcome message, explains the benefits of creating an account, and urges you to log in or create an account. The login screen portion of the website also includes all account creation elements.

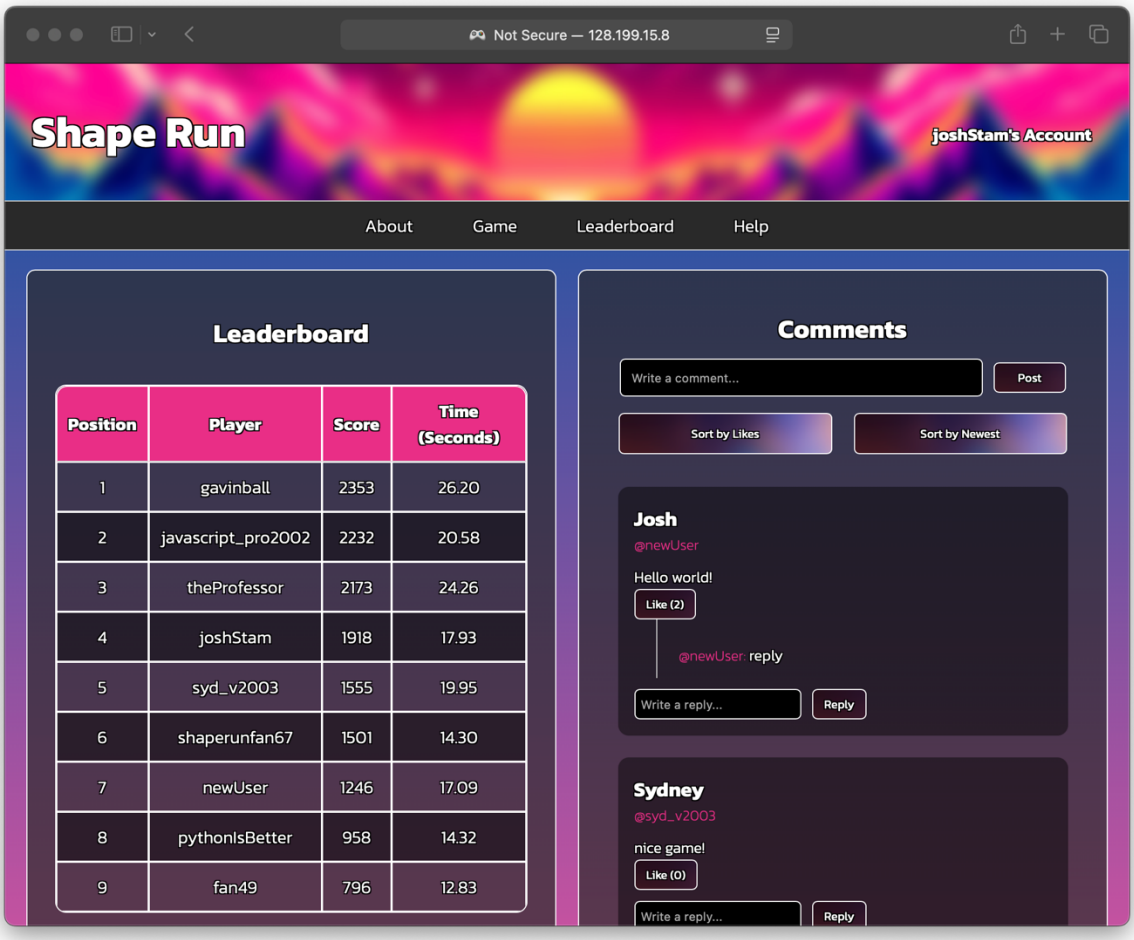
2.2 – Game Area

The game area is intended to be reminiscent of flash games of the 2000's and 2010's, with a window being on the page for the gameplay. It will also have the base webpage elements like the header and the page navigation bar. This is the end result:



2.3 – Leaderboard/Social

The leaderboard area is to be a split leaderboard/social forum page. On one part of the page, there is the leaderboard table with users' names, positions and scores. Another part of the page is like a YouTube comment board where users can leave comments and interact with them. Certain ways you can interact with another user is by liking comments and commenting on other comments. Users are also able to filter or sort comments as they choose. A visual of the completed layout of the leaderboard social page is shown on the next page.



2.4 – "Realism" Elements

"Realism" elements are what we are describing as pages or page elements and general professionalism that make the project feel more like a live website and not just a class project. Things like "About" pages, "Help" instructions, user profile page and the welcome splash screen are elements that help users, add context and that you would expect from a business or personal website.

3 Backend

3.1 – Database/Server

The server is implemented using NodeJS and express. The database of the server is set up using the "mongoose" module. Our database is structured to support the following data. "Player" ata will contain users login information along with other identifying user information that they provide when signing up for an account. "Leaderboard" data will store information about

leaderboards in the database such as player positions, statistics and scores. We also support "Comments" data which store things like comments, post interactions, and liked used in the comments aspect of the website.

3.2 – Game

We did not use additional modules for game design as they were not necessary for the scope of our game. We used JavaScript to implement our game. We created a game with "infinite" replay potential like arcade games like Galaga or Super Mario Bros. It is closest in function to Geometry Dash. Progression is linear by score which is a combination of time spent and enemies passed. We wanted the game to be approachable for many audiences, this means making the controls simple and approachable and maintaining a difficulty that is easy to pick up but gets more difficult as you progress. As you survive longer in the game, the speed at which the game scrolls will increase. This makes the game harder as you dodge obstacles and enemies.

3.3 – Social

The social aspect of our website deals with user interaction through posts and/or comments that users can like, sort and comment on. We will implemented this by using JavaScript to generate HTML elements for our webpage as new posts and comments are created. We store comments and interaction details in the database on the backend, and our client accesses and display them while the website is running.

4 Reflection

We learned a lot while doing this project. Specifically, we learned a lot about how servers and webpages interact with each other on the web. Using hashed passwords and sessions helped us understand how a webpage handles our requests, and how they authenticate the users on their pages. We had lots of troubleshooting trying to get everything to talk to and work with each other, and introducing databases proved to be challenging. Creating a game in JavaScript was no simple task either. We did not use any game engine modules for our game, so we had to handle a lot of things ourselves like collisions, sprites, scoring and environments. This was one of our biggest challenges, as we originally planned to include different levels and more game customization, but we did not realize how much of a feat it would be.

Overall, the project went well. We were able to communicate and collaborate effectively and we were able to successfully delegate and split up tasks so that we were not conflicting with one another in our commits. Setting up DigitalOcean was a new experience and admittedly took longer than expected, but it was cool learning how to host on the web yourself. The most "didn't go well" part of the project was just the debugging and development process. Working on things we have not done before proved challenging, and things like understanding how sessions work

and how to build a game from scratch took some extra time and attention to detail. Both of us wished we had more time to work, as there are still things we wanted to implement but just didn't get to. These are things like further developing the social network aspect of the site, allowing for direct messages and user lookup. These were original ideas that we had to cut due to other challenges. As previously mentioned, we would have also liked to spend more time polishing and expanding upon our game.