



WEB APPLICATIONS AND DATABASES-CST 2120

COURSEWORK-1

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1. Introduction:

Aims and Objectives: For my coursework, I chose to make a Space Invaders inspired game, where a spaceship is to avoid asteroids as it passes through an asteroid field.

I chose this game as its gameplay seemed interesting and fun to code, and because it integrates elements of science fiction.

I attempted to create a game that included:

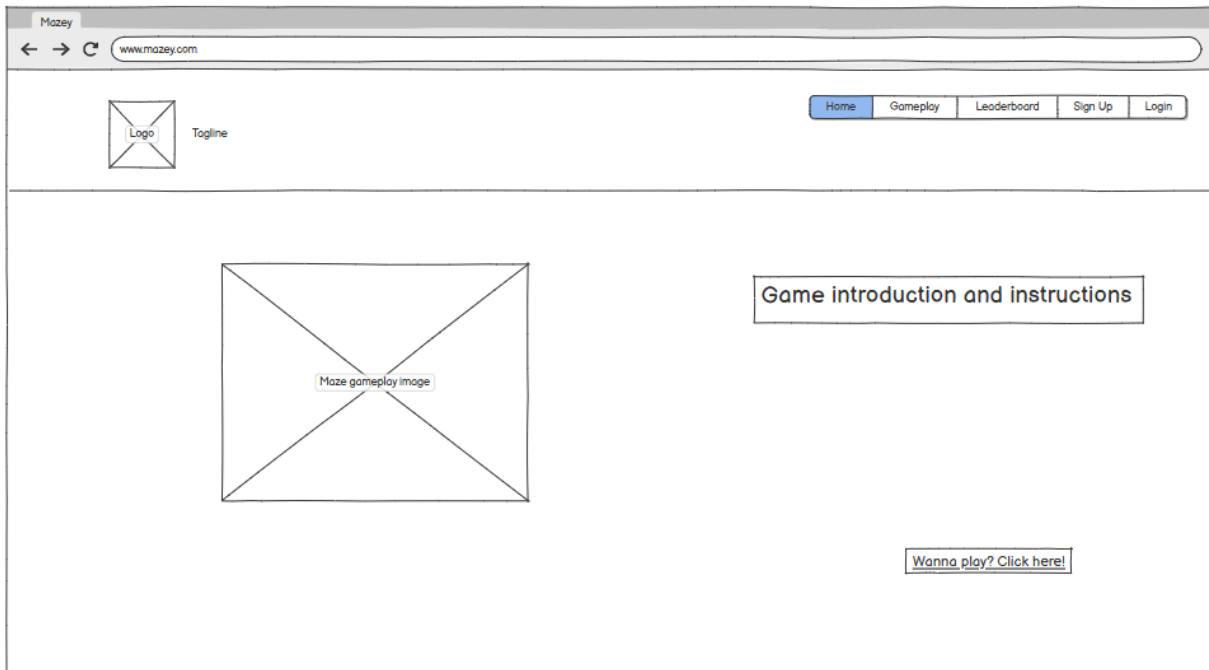
1. Random generation,
2. Obstacle avoiding,
3. A timer that acts as a score,
4. Bullet shooting mechanism.
5. Fully functional leaderboard.

2. Planning:

The first step to create my game was to have a rough idea of what I wanted my website to look like. To do so, I used ‘balsamiq.com’ (mentioned in the module) to create a simple wireframe.

Wireframe:

1.



The home page here includes instructions on how to play the game, as well as a link to the gameplay. The header includes the game logo, a tagline, and a navigation bar.

A link to the gameplay was supposed to be part of the homepage as well. However, I found doing so to be of little use given that the navigation bar is fully functional.

2.



The gameplay page is quite simple, with the page containing nothing but the game itself. Within the game, various features such as a timer and animations have been integrated.

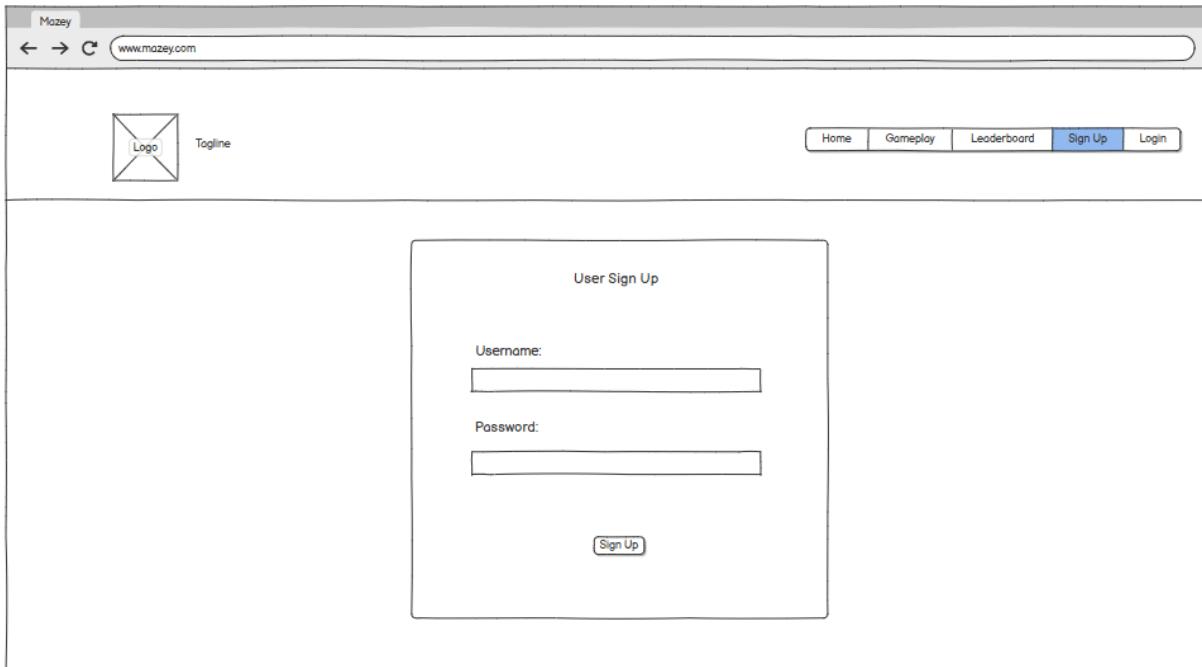
3.

The screenshot shows a web browser window with the title 'Mazey' at the top. Below the title is a navigation bar with icons for back, forward, and search, followed by the URL 'www.mazey.com'. On the left side of the main content area is a logo icon labeled 'Logo' and 'Tagline'. At the top right are navigation links: 'Home', 'Gameplay', 'Leaderboard' (which is highlighted in blue), 'Sign Up', and 'Login'. The main content area contains a table with the following data:

Player Name	Score	Rank
Player 1	400	1
Player 2	200	2
Player 3	100	3
Player 4	98	4
Player 5	90	5

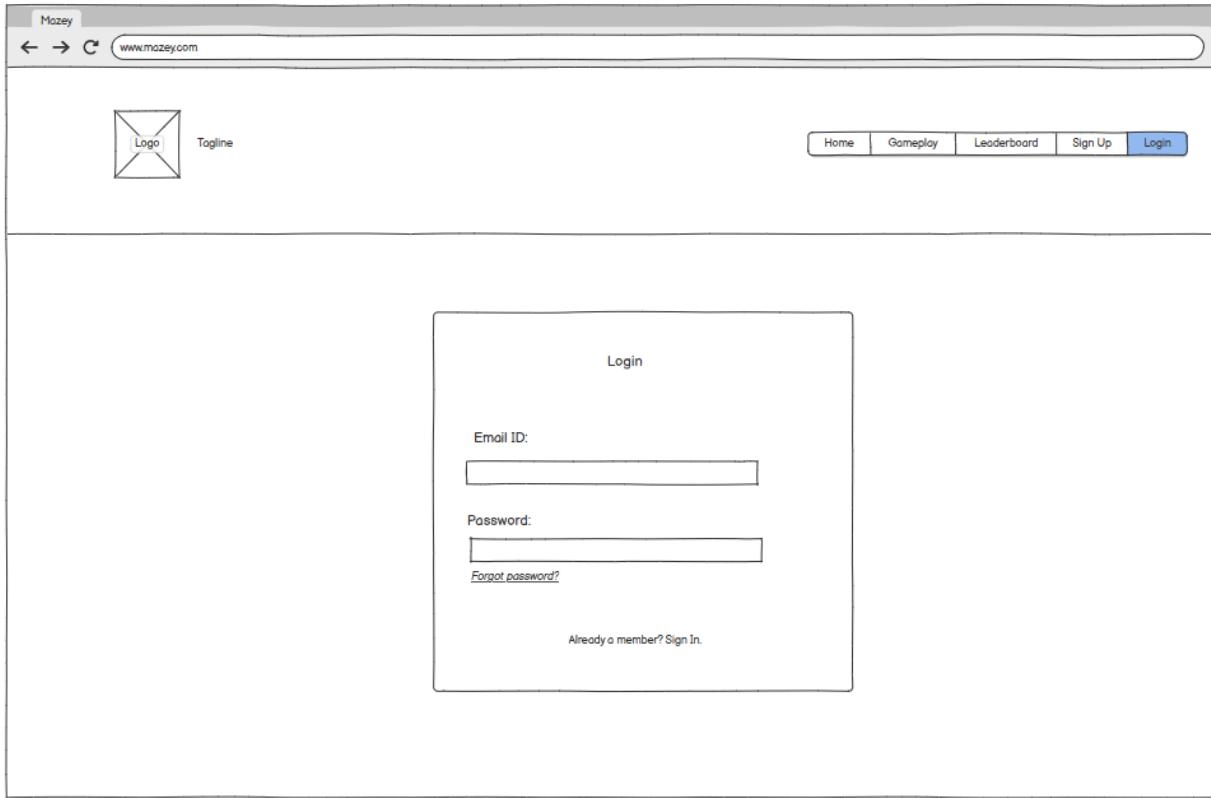
A simple leaderboard, it stores the player's names, scores and ranks.

4.



The sign-up page contains a simple box, which takes in player's information.

5.

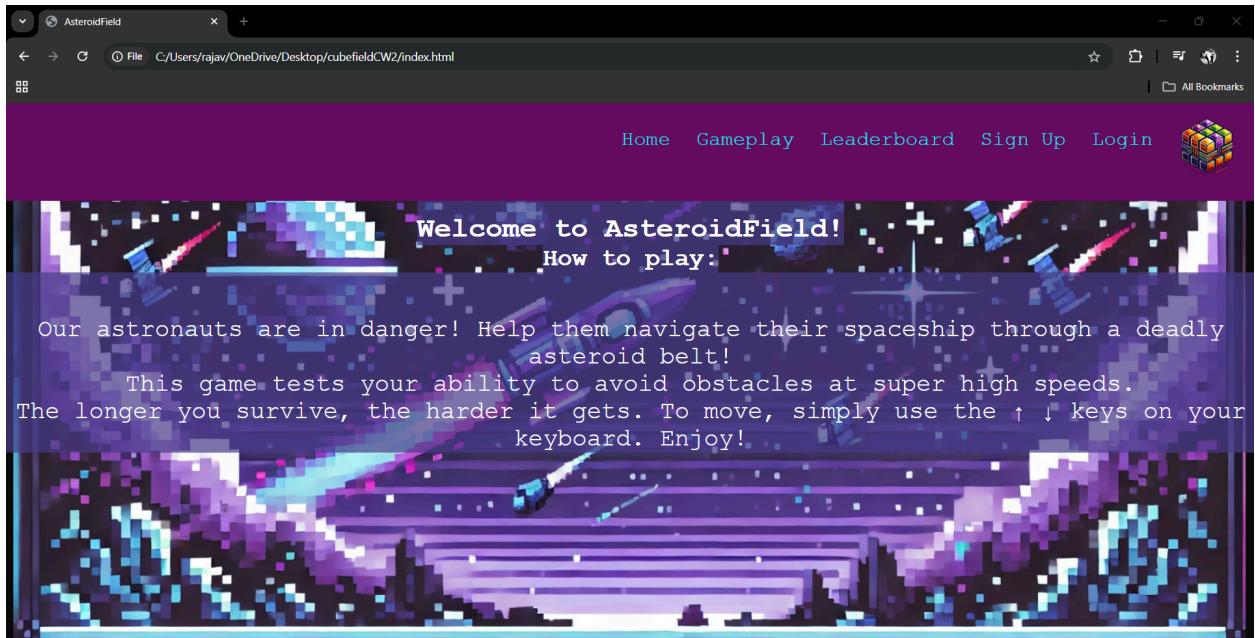


The login page works similarly, with the addition of a ‘forgot password’ option.

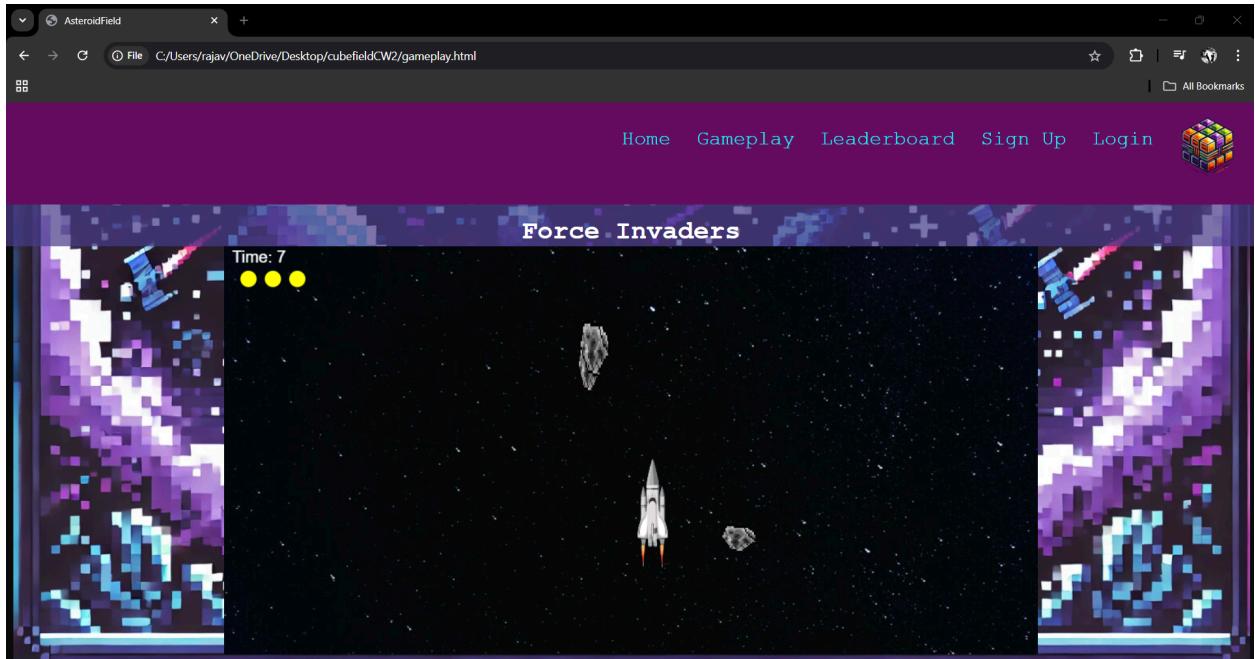
3. Development

Developing the game took six weeks and was a long process. We first began by working on our HTML and CSS, and then moving on to our JavaScript.

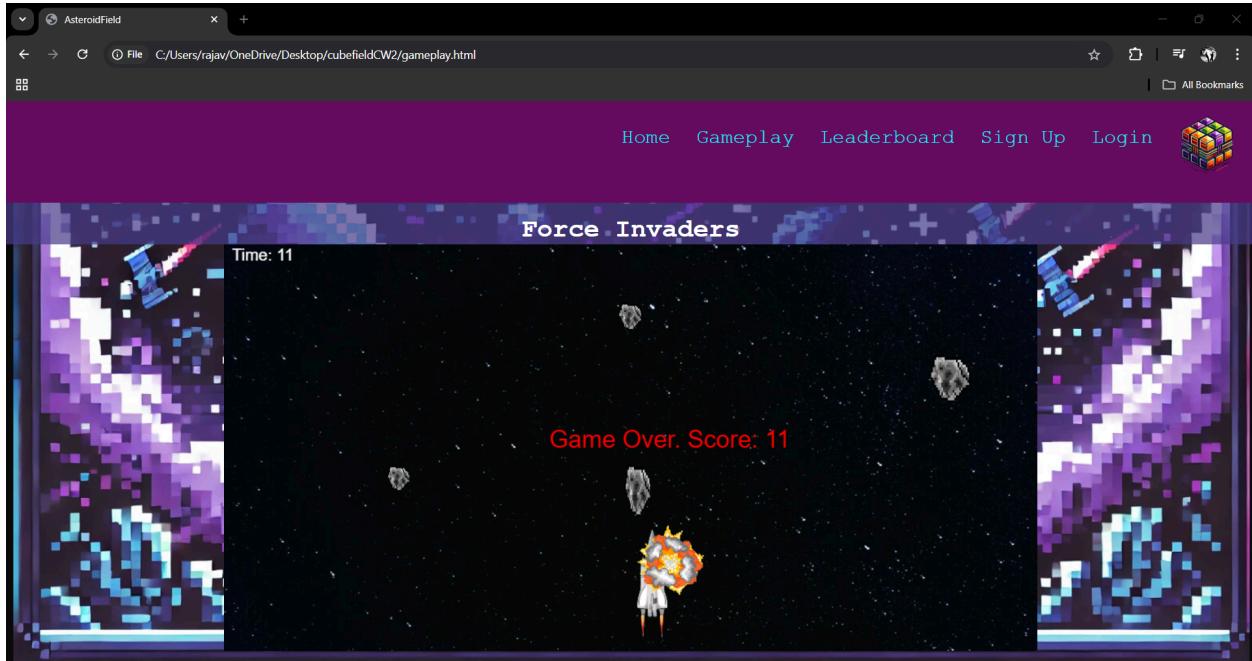
The final website incorporates many elements to ensure that users do not find it difficult to navigate through the website.



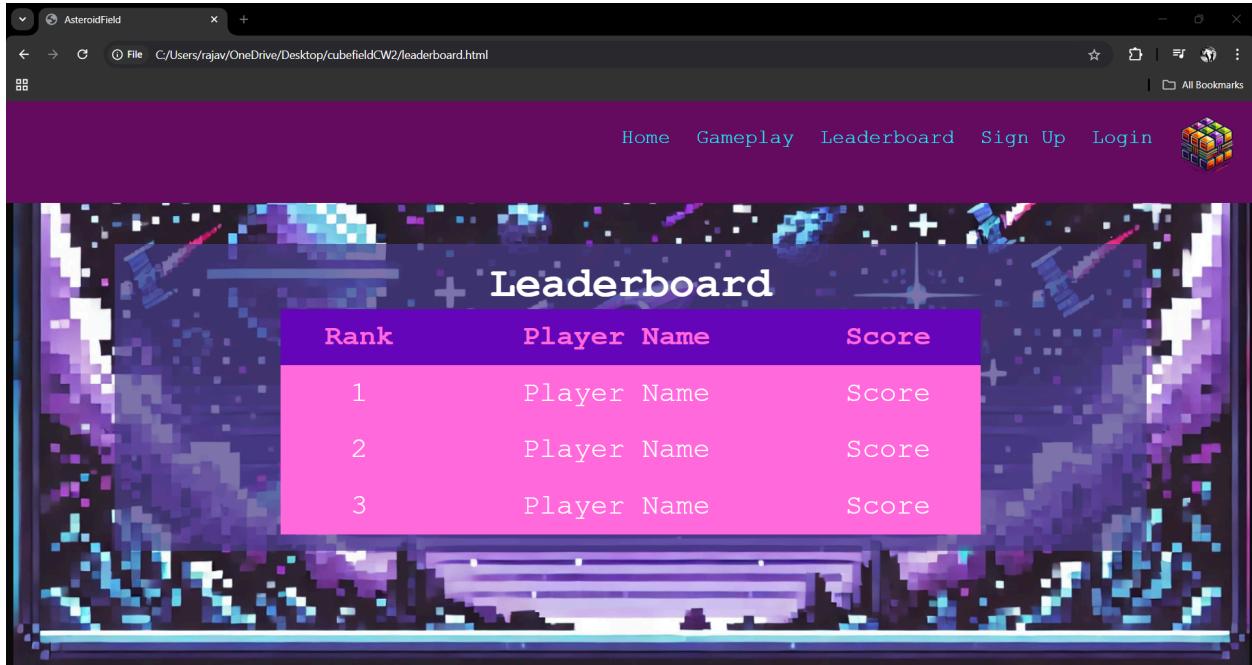
Given above is a screenshot of the home page- It contains an introduction to the game and instructions on how to play.



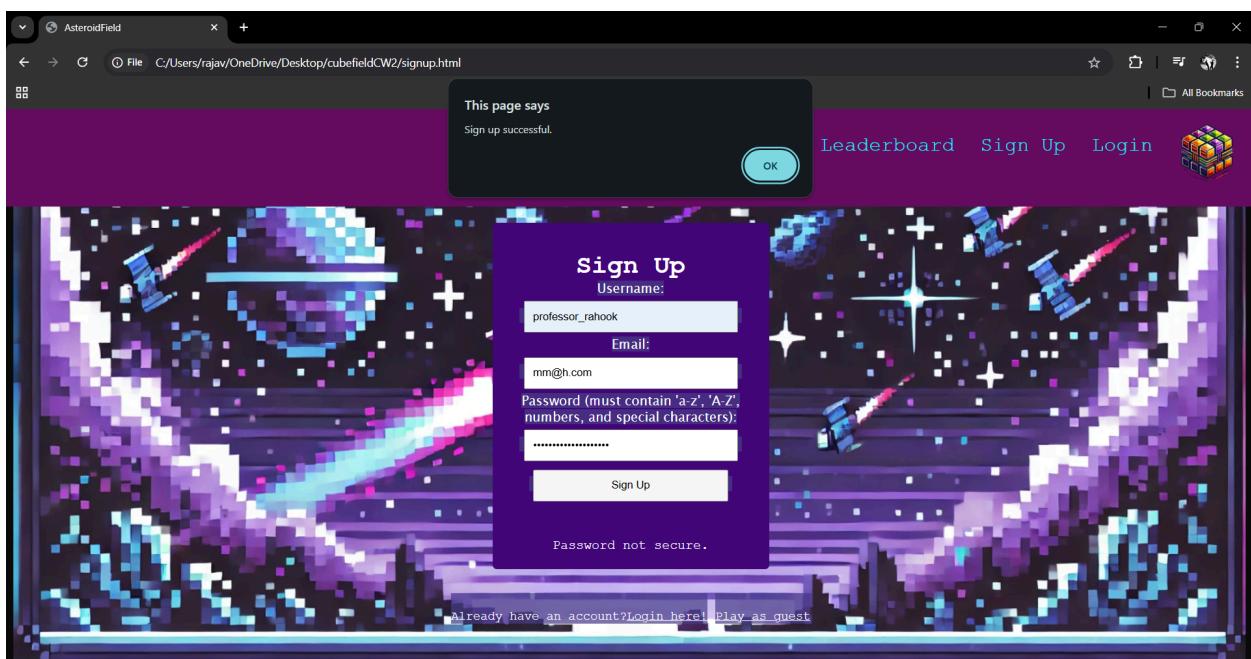
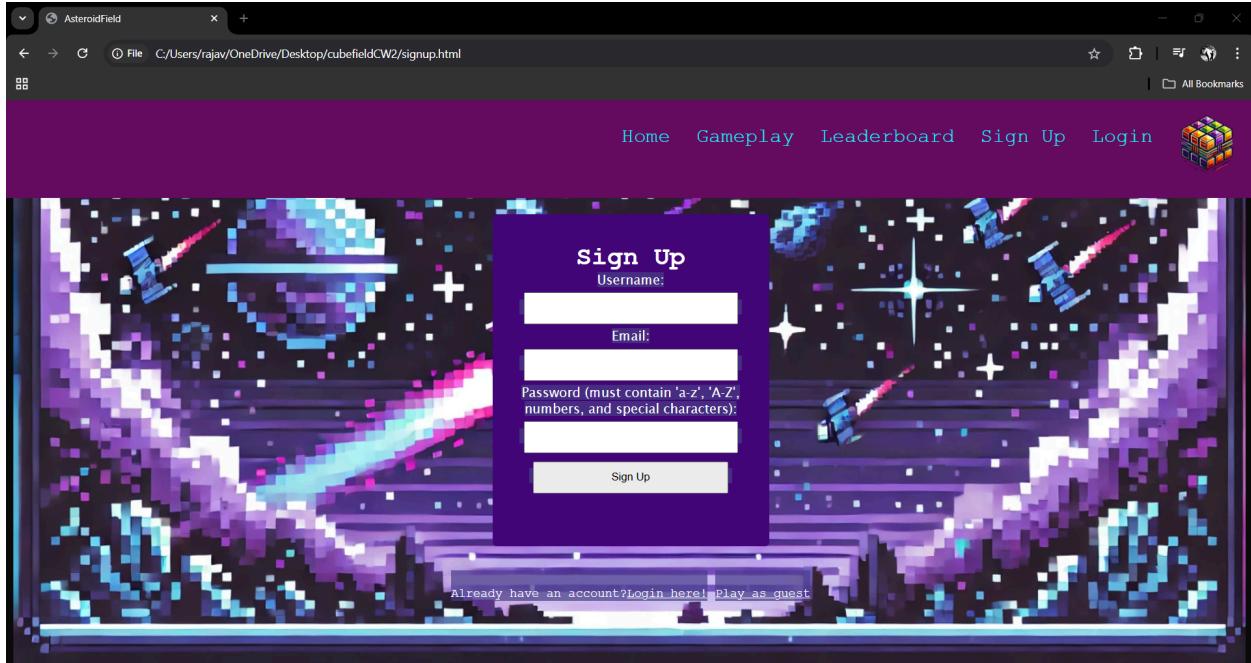
This is a screenshot of the ‘Gameplay’ page. The game includes a moveable spaceship and randomly generated asteroids it must avoid hitting. A timer keeps track of how long the player stays in the game. This serves as a score as well, and the final score is displayed on the screen after the player loses all attempts or ‘lives’.



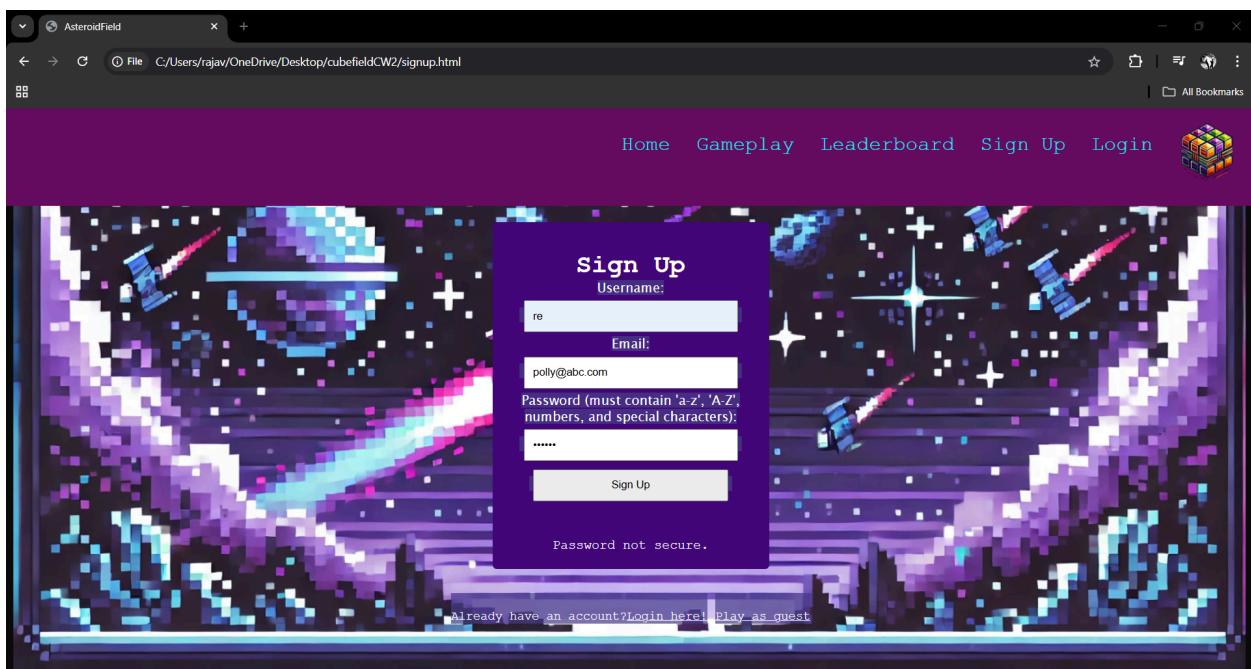
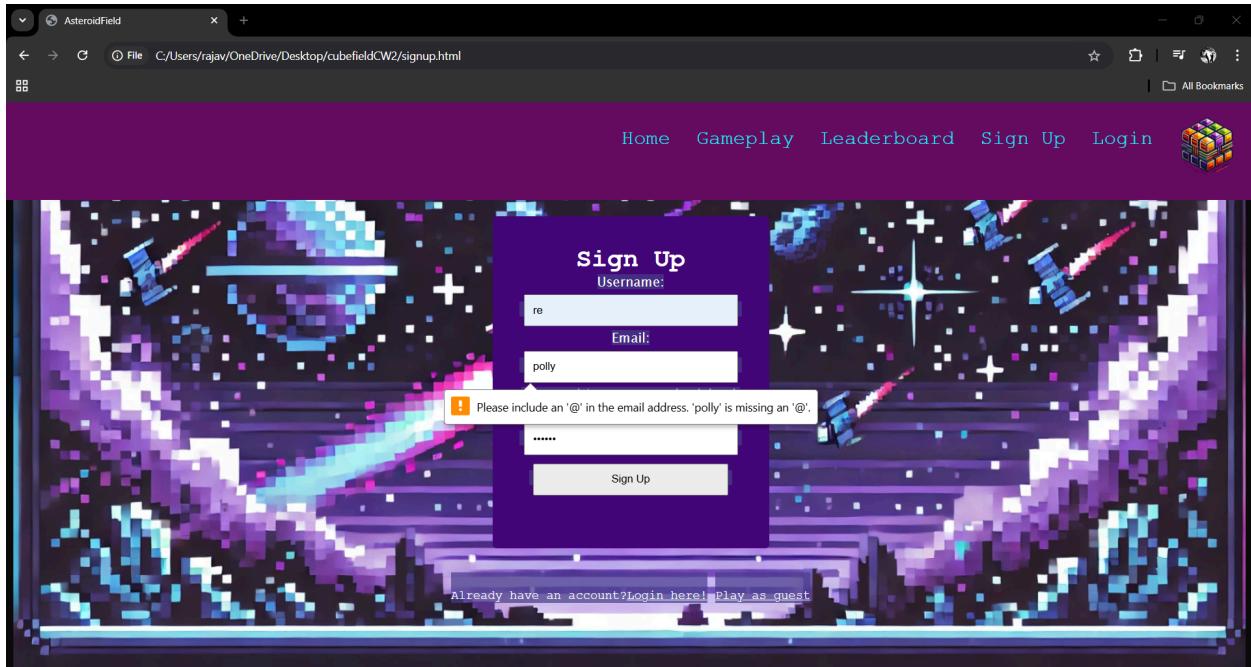
Given above is a screenshot of what the gameplay looks like upon losing the game. All 'lives' or attempts have been exhausted and the final score of the player is displayed on the screen.

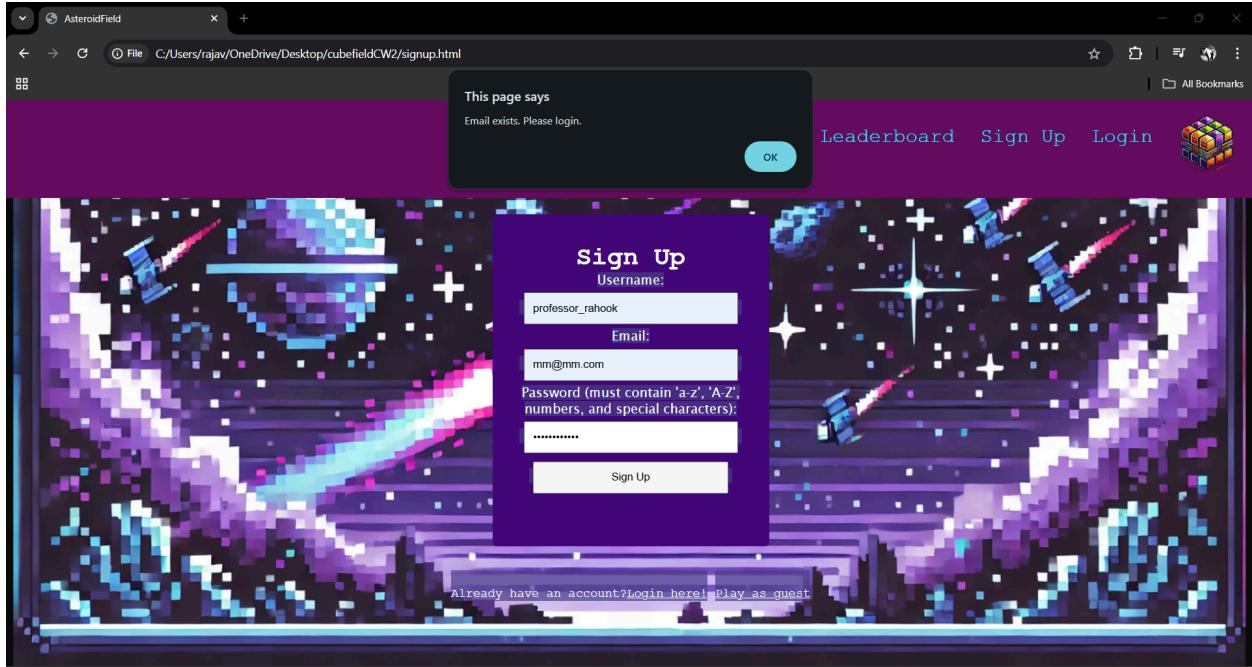


The leaderboard table initially contains dummy data and does not store player data. An attempt to fix it was made, and the leaderboard.js file contains a code to do so. However it does not function and does not store player's data and scores.



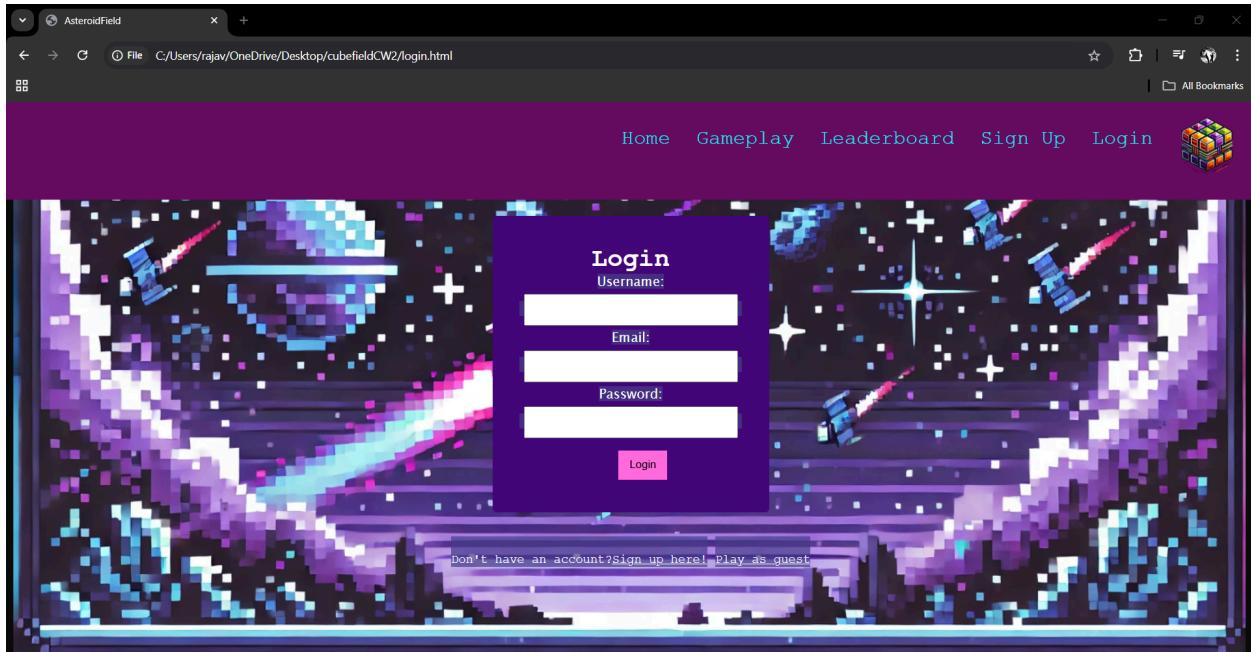
The sign-up page contains a box that takes in user input. Validation has been checked so that invalid email IDs and insecure passwords cannot be saved, and an error message shows up on attempting to do so.



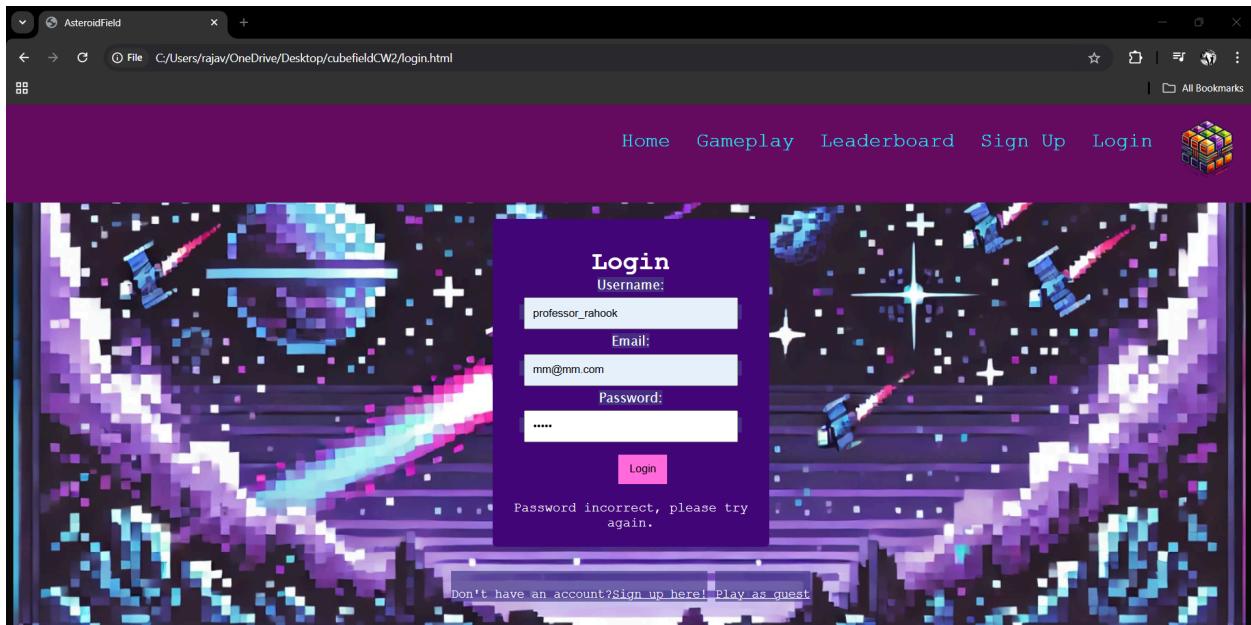


Also, if a user is already signed in, re-signing in is not allowed. Instead, they are redirected to the login page where they must login instead.

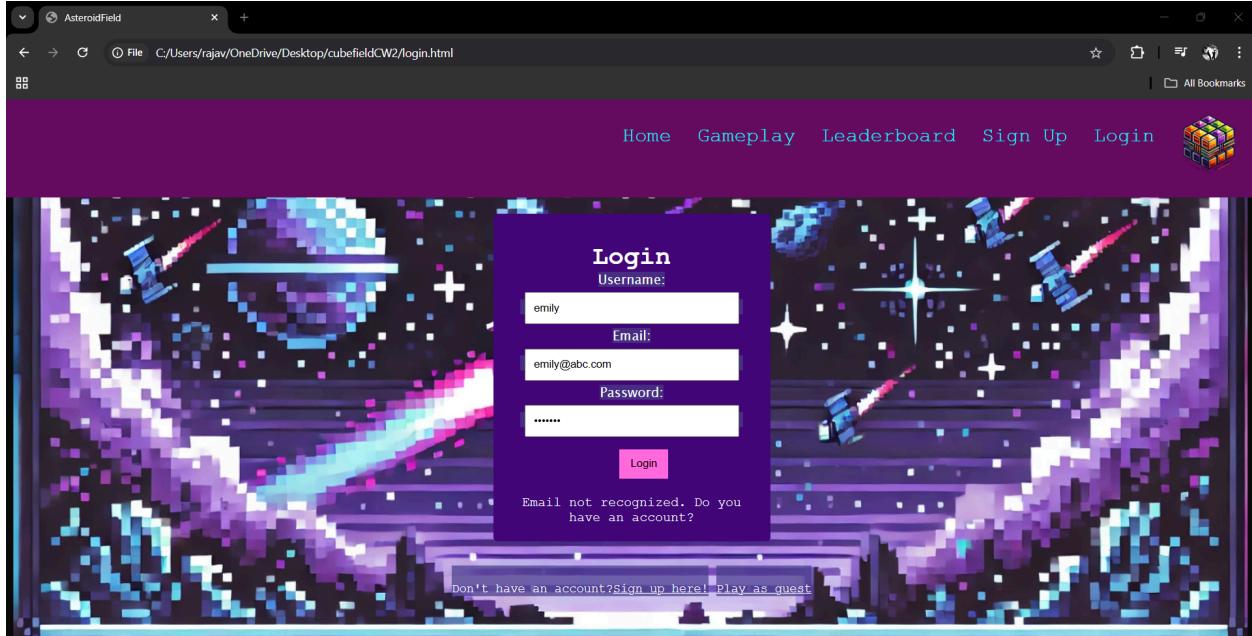
Additionally, a hyperlink is provided at the bottom of the box to redirect users as well.



The login page has a similar outline to the sign up page. Here however, the user is redirected to the gameplay page on clicking the login button.



On entering the incorrect password, an error is raised.



Also, if a user's data does not exist in local storage, an error message is displayed.

4. Testing

My code was tested by my professors, Ms Sumitra and Ms Kashfi. Initially, I faced problems with my CSS and JavaScript.

1. My login and sign-up forms were not clearly visible or centered. The pages looked messy, and did not appeal to the eye. This was fixed by changing the margins and adding an opaque-coloured background to the forms.
2. Users who signed in were able to re-sign in with the same credentials. This faulty behavior was corrected by checking

the localStorage for the same. If those credentials existed in the localStorage, an alert message would inform users of the same.

3. For the gameplay, the asteroids would fall at speeds far too high to let players win at times. They would also fall in large numbers, making winning almost impossible at times. This was easily fixed by multiplying the speed by a smaller number, and setting a limit on the maximum number of asteroids.
4. The leaderboard table does not take values from logged in users and is faulty. While the code to do so exists, the leaderboard page itself does not update according to players' scores.
5. The shooting mechanism that allows players to shoot bullets from the spaceship is non functional and does not destroy asteroids on impact. Bullets are only being expelled from the ship.

5. Conclusion

Overall, the game has mostly functional elements, with room for improvement. HTML, CSS and JavaScript validation was done using W3C.

The screenshot shows a web browser window with the URL validator.w3.org/nu/#file. The title bar says "Nu Html Checker". The main content area displays the following text:

This tool is an ongoing experiment in better HTML checking, and its behavior remains subject to change
Showing results for uploaded file index.html

Checker Input

Show source outline image report Options...
 Check by file upload Choose File | No file chosen
 Uploaded files with .xhtml or .xht extensions are parsed using the XML parser.

Document checking completed. No errors or warnings to show.

Used the HTML parser.
 Total execution time 4 milliseconds.

[About this checker](#) • [Report an issue](#) • Version: 24.10.31

Experience: While this coursework was certainly challenging in a few ways, it was an enjoyable learning experience to be able to code a whole game and develop a website by myself. I found most aspects of this coursework to be quite interesting, and I got to dive deep into the world of web and game development. Moreover, I got to get a basic hold over a new language, JavaScript, and learnt a lot about what the inner workings of a website are. I certainly find myself inspecting quite a few websites on occasion as well. I learnt a lot more in this coursework than I would have through self study, in a short six weeks. I now have a taste of what web and game development looks like on a much larger scale and consider it a potential choice for my future. Initially, I was skeptical and worried about coding in JavaScript as I had little to no exposure to the language. However, I found coding my game to be a lot easier than expected and was pleasantly surprised at how much I

enjoyed the project. While I still have a long way to go in that regard, I have certainly found a new interest and am now motivated to work at getting better at the same.

Future scope for the game: I plan on working on my leaderboard and shooting mechanism so as to have a fully functional beginner's game. I also plan on refining my game and adding new features in order to make a more advanced sci-fi game with lots of interesting elements such as enemy spaceships, rogue asteroids, planets, and potentially black holes. I also plan on adding a 'sign out' and 'log out' feature for my game as well.

