

# *Aim Trainer*

## Web Application Design and Development Summative

### Introduction

Aim Trainer is a web-based game. Its structure is simple, and its name is intuitive. As the name suggests, the game challenges users to test their speed and accuracy in fun and engaging ways. The idea mainly came from reaction time tests and other clicker-based sites, with the first idea iteration having an animal or seal-based theme, but I decided this would have been too difficult. The premise of this website is to provide the user with a structured website while also providing a game to play and help improve their mouse skills.

The main goal was to use a themed, short, and adaptable experience. In doing so, allows users to easily understand and play with little to no instruction. Although the premise is simple, clicking targets to increase a score, I added other features regarding the custom mode. Settings like crosshair, changing the shape of targets, and fully adaptable colours. These help players customise their choice, instead of being too restrictive.

In terms of user experience, there is less style over clarity. The website is simple, obvious and accessible. There are minimal animations, and aside from the videos on the home page, there are few distractions. I aimed to focus on the game itself, rather than having stunning visuals. However, I did work towards making the site not look too plain, mainly because the game itself is very minimal, and if the player is not on the game webpage, the rest of the pages are more functional.

### Usability and UXD

The entire design for Aim Trainer is for the desktop, with the core audience being mouse-based users. As such, supporting other devices such as phones would have been redundant, since it is not targeting touch-based mobile app games. Although it could work, it would not provide a seamless experience due to the nature of p5.js and HTML canvas. This feature could be investigated in the future, but it makes sense to have no mobile responsiveness for now.

Each page has one purpose. When designing, I struggled with what to put on each web page since, due to the nature of the game, there are limited requirements for additional information. This kept all the pages straightforward and easy to understand. Although each page has limited functionality, they are intuitive and easy to use for a new or existing user.

The main custom settings page utilises dropdown menus for each setting. This was the most efficient way to select options. They are styled to be reasonably sized and easy to see. Thus, straightforward for the user to pick the settings they want, and then press save at the bottom of the screen. Additionally, these dropdowns make it slightly more interactive while still compact. If anything besides these were used, the settings may have been too complicated for a user to understand and navigate. In contrast to this, dropdown buttons are accessible using the keyboard. There is also a responsive save button at the bottom of the settings page. Although

this button was sourced from Gemini AI, it is a handy feature because it provides feedback to the user to let them know that the settings have been saved.

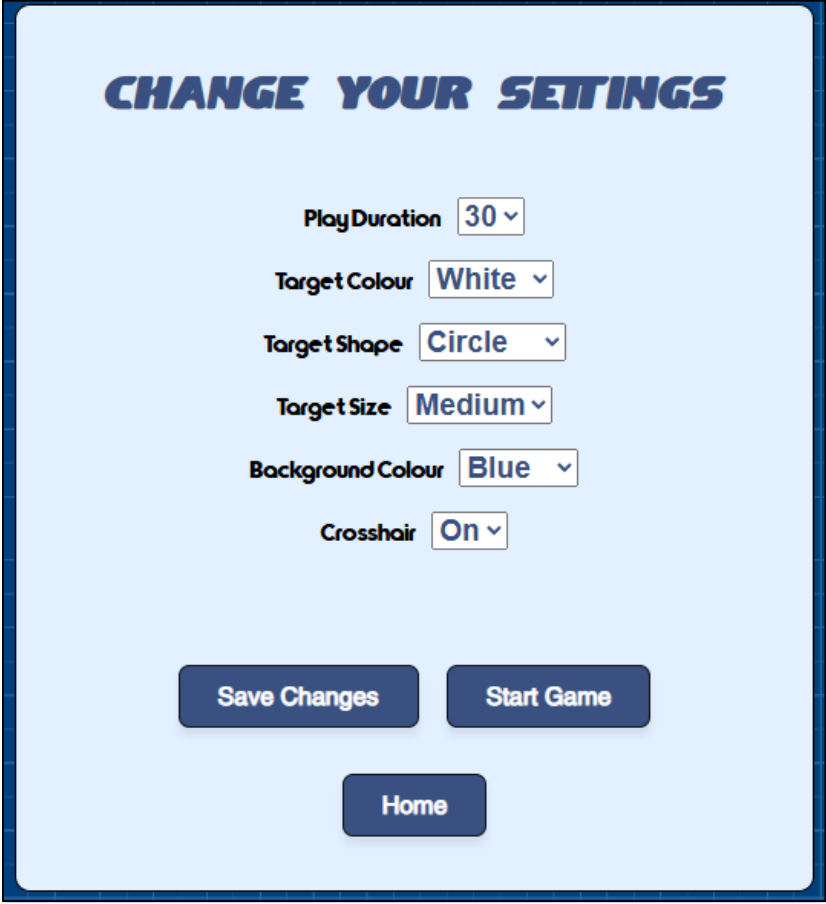
The image shows a settings page with a light blue background and a dark blue border. At the top, the title "CHANGE YOUR SETTINGS" is written in a bold, dark blue, italicized font. Below the title, there are six settings, each with a label and a dropdown menu: "PlayDuration" with a value of "30", "Target Colour" with a value of "White", "Target Shape" with a value of "Circle", "Target Size" with a value of "Medium", "Background Colour" with a value of "Blue", and "Crosshair" with a value of "On". Each dropdown menu has a small downward arrow on the right. At the bottom of the settings list, there are three buttons: "Save Changes", "Start Game", and "Home". The "Save Changes" and "Start Game" buttons are positioned side-by-side, and the "Home" button is centered below them. All buttons are dark blue with white text.

Figure 1 - Settings Page

Across all webpages, excluding the gameplay screens, there is a navigation bar at the top. It is dark and consistent. It is also a perfect size, not intrusive yet visible. Nothing is behind the separate menus. However, with the focus on being simplistic and accessible, all the menu items are buttons, and each clearly shows the player what they are used for.

As mentioned, all the menu items are sized effectively to aid accessibility. Additionally, all buttons are very similar in their hover animation and look. They are easy to understand and provide good colour contrasts between the blue and white used. Furthermore, I aimed to use a pale colour palette to improve readability. Although the user can change background colours, the text on canvas remains visible.

Feedback within the game itself is an important part of gameplay. I made it so that the user interface on the left side of the screen is straightforward and updated as the game is played. It shows the score, the name, the time and the current accuracy. This feedback helps keep the players engaged, which is important since the game itself is very basic.

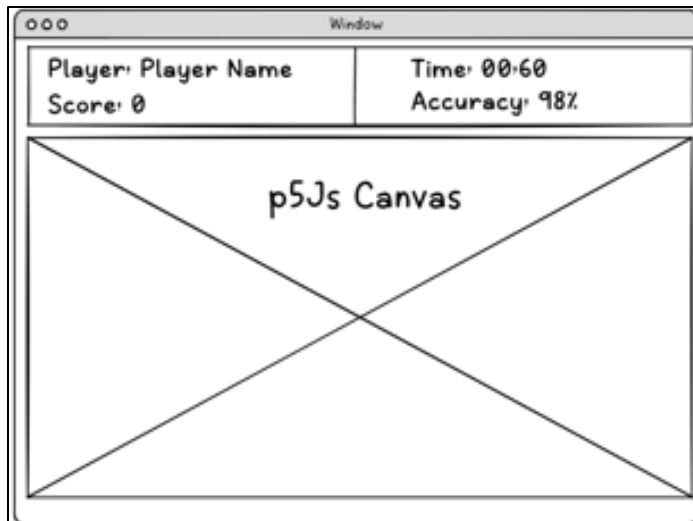


Figure 2 - Gameplay UI Original Design

Although there are no animations, sound is important. During the game, when you press the left click, a responsive “pop” noise is played to indicate to the player that they have hit the target. This helps the game to feel more immediate and helps to provide more focus to the player. The downside of this currently is that there is no option to turn off the sound. Unfortunately, I could not get the local storage to work as it did for the other settings.

The final scoreboard for the main challenge was initially designed to show the top scores (Figure 3), but I later adapted it to show the score and accuracy in a table instead of a list. This change was to aid the overall usability and general clarity. The new and final design is much easier for a player to understand and feels more like a scoreboard (figure 4).



Figure 3 - Initial Design

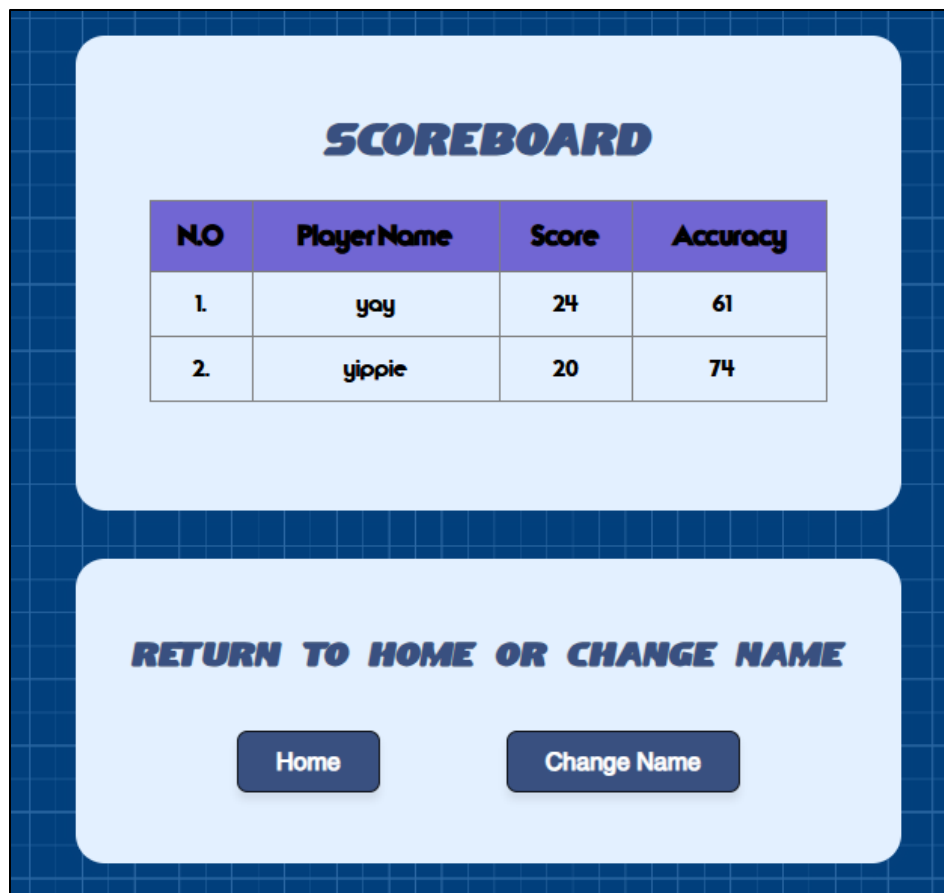


Figure 4 - Final Scoreboard

Overall, the experience should have a simple and sleek design while providing the player with an interesting and easy-to-use experience. It would take away from the game's central premise if it were too flashy or had many animations.

## Technical Implementation

Aim Trainer uses HTML, CSS, JavaScript and p5.js (JS library) for the entire website. Each page is under its own HTML file and, depending on the page, is connected to a JavaScript file.

Additionally, all pages are styled from the main styles.css file.

The game itself is run from either the play.js script or the challengeMode.js script. Each one utilises both the p5.js canvas property to place a canvas into an HTML div object at a specific part of the page. I decided to use p5 since it was the library I am most familiar with since having worked with it before. P5 was a perfect fit for the game idea. As it is essential for handling interactions between the player and the game. Whilst being managed by the draw() function, which displays the targets and runs the functions. The UI next to the canvas also uses p5 and local storage to be updated in real time. The values on the user interface are updated by using (document.getElementById().innerText), which accesses the interface and updates it based on the values from the game.

Data is collected from the user through a series of HTML forms linked to JavaScript files and functions, depending on the data needed. For example, in the settings page, the user selects the setting they want to use from each dropdown menu and then presses save. The save button links to a script that uses (localStorage.setItem()). Local storage refers to a browser storing

saved information even if the tab is closed. These saved settings affect different aspects of the game, from the target size to the colour and the background. Additionally, the game utilises default local storage values, which were done using the JS event (DOMContentLoaded) based on guidance from MDN web documentation (Mozilla, 2025).

Similarly, the scoreboard system utilises the same local storage but in a separate JS file. When the challenge mode game ends, the score is saved and automatically added to the list of scores, which then updates the table. Since I changed the table to use player name, score and accuracy, I moved to JSON.parse to put the string into a manageable data format.

The challenge and game modes use p5.js, which spawns the shapes and is used to update the game. All gameplay is based on the draw() loop and is mainly controlled by if statements. I could have used switch statements or classes in this situation, but they would not have provided different functionality. However, it would be something to consider implementing if I want more settings, gameplay or functionality.

Lastly, the CSS is done in a separate CSS file linked to all HTML files. The styling is relatively unstructured, providing the website with colours, different fonts, better font sizes, and a better layout. I use the same styles across all pages with only a slight variation in colour in the ending section. As stated before, I did not use media queries since I was not aiming for a mobile layout. The website fits and is optimised for only a PC or laptop.

## Use of Generative AI and References

When creating the website, I used different sources, including W3Schools, MDN web docs, and Gemini AI, to help with aspects I struggled with. W3S and MDN references were mainly used for JavaScript syntax and DOM interactions, as I struggled with this at the start. However, from utilising these references, I got my head around them and later on was able to use the same features effectively and without further help. In the code, I have included block comments that show my reference to W3Schools and MDN, which I used repeatedly when going over the code to gain a better understanding.

I first used Gemini AI for a few features I could not understand after looking them up. Features like the save button animation and aspects regarding local storage were helpful as they allowed me to work with the code to better structure the website to how I wanted it. In most cases, I rewrote and referenced Gemini AI code. However, with the save button, I had less idea how to make it, so I used AI for that and referenced accordingly. Overall, I understand all the code generated. It helped structure how to do something specific related to how my website works. All the sources I used played a crucial role in helping me, as I would have been stuck with a less functional game if I had not taken the time to understand them.

## Reflection

Overall, I am not that happy with the project. The main idea I wanted to work on was to provide the user with what I expected of a simple aim training game with settings. However, it is too simplistic and lacks visuals. I should have chosen to stick with my idea of having a theme to make the game more interesting, or adding animations could have provided more intractability, since it feels a little underwhelming. The reasons for this are mainly stemming from a lack of creativity. As a result, the website looks visually okay, but could have been a lot better. Its simplicity makes it accessible, but more settings and adaptability could have been added

without reducing its usability. The code structure and general use of JS functions can be improved to better handle the user's data.

For general improvements on usability and the website, I could work towards implementing tablet responsiveness since a user can look for aim trainers on a tablet, which could use touch. There is no pause menu when playing or options to mute the sound, since I could not get it to work, although this and responsiveness are something I could implement in the future.

## Conclusion

Aim Trainer started as a more complex concept but had to be reduced to fit within time constraints. However, aside from the changes that were made to the design, the overall Aim Trainer experience is still there. I learned how to store and update the user's data effectively with local storage, a topic I struggled with. In general, the site does what it was designed to do. My focus was providing the user with a way to test, train and challenge their aim. There is room for improvement, especially related to making the game feel more interactive, usable and, overall, more appealing.

**Word Count: (1997)**

# Copyright Appendix:

| Description of Asset<br>(include any images) | Source<br>(include URL)                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Location on<br>your web<br>application                                               | License/Permission       |
|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------|
| Background Image                             | <a href="https://www.freepik.com/free-vector/abstract-grid-line-pattern-blueprint-sheet-background_310506049.htm#fromview=search&amp;page=1&amp;position=3&amp;uuid=753b1814-6c43-46c6-a441-e688f6346776&amp;query=Blueprint+Grid+Background">https://www.freepik.com/free-vector/abstract-grid-line-pattern-blueprint-sheet-background_310506049.htm#fromview=search&amp;page=1&amp;position=3&amp;uuid=753b1814-6c43-46c6-a441-e688f6346776&amp;query=Blueprint+Grid+Background</a> | Main\assets\27e9691d-e326-425b-a06f-f7efc3dc8a2f.jpg<br><br>Background for all pages | FreePik Content License  |
| Pop sound                                    | <a href="https://pixabay.com/sound-effects/bubble-pop-6-351337/">https://pixabay.com/sound-effects/bubble-pop-6-351337/</a>                                                                                                                                                                                                                                                                                                                                                           | Main\assets\bubble-pop-6-351337.mp3<br><br>Clicking pop sound                        | Pixabay Content License  |
| LetterHuman Font                             | <a href="https://www.fontspace.com/letter-human-font-f142940">https://www.fontspace.com/letter-human-font-f142940</a>                                                                                                                                                                                                                                                                                                                                                                 | Main\assets\LetterHuman-4n66Y.ttf                                                    | Freeware, Non-Commercial |
| Swansea Font                                 | <a href="https://www.fontspace.com/swansea-font-f5873">https://www.fontspace.com/swansea-font-f5873</a>                                                                                                                                                                                                                                                                                                                                                                               | Main\assets\LetterHuman-4n66Y.ttf                                                    | Freeware, Non-Commercial |
| Typographica Font                            | <a href="https://www.fontspace.com/typographica-font-f23015">https://www.fontspace.com/typographica-font-f23015</a>                                                                                                                                                                                                                                                                                                                                                                   | Main\assets\Typographica-Blp5.ttf                                                    | Freeware, Non-Commercial |

# Bibliography:

Mozilla (2024) *Document: DOMContentLoaded event – Web APIs | MDN*. Available at: [https://developer.mozilla.org/en-US/docs/Web/API/Document/DOMContentLoaded\\_event](https://developer.mozilla.org/en-US/docs/Web/API/Document/DOMContentLoaded_event) (Accessed: 30 May 2025).