

CST-350 Milestone 3 Partial View Updates

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Course Number: CST-350

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12/1/2024

GitHub Link:

https://github.com/amfrear/cst350/tree/main/Milestone_3

Video Link for Code Review:

<https://www.loom.com/share/c2a24c3efce24cd8a9eb7248ac548b91?sid=f21b8515-10a4-49ad-9a5b-cba81f1ba3f2>

Video Link for App Running:

<https://www.loom.com/share/4752c9b4eafa455c9046dc546ea962e5?sid=8ada176b-4c62-4b4d-ac0e-319e202ba627>

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Application Overview

Screenshots:

1. Initial Game Board State

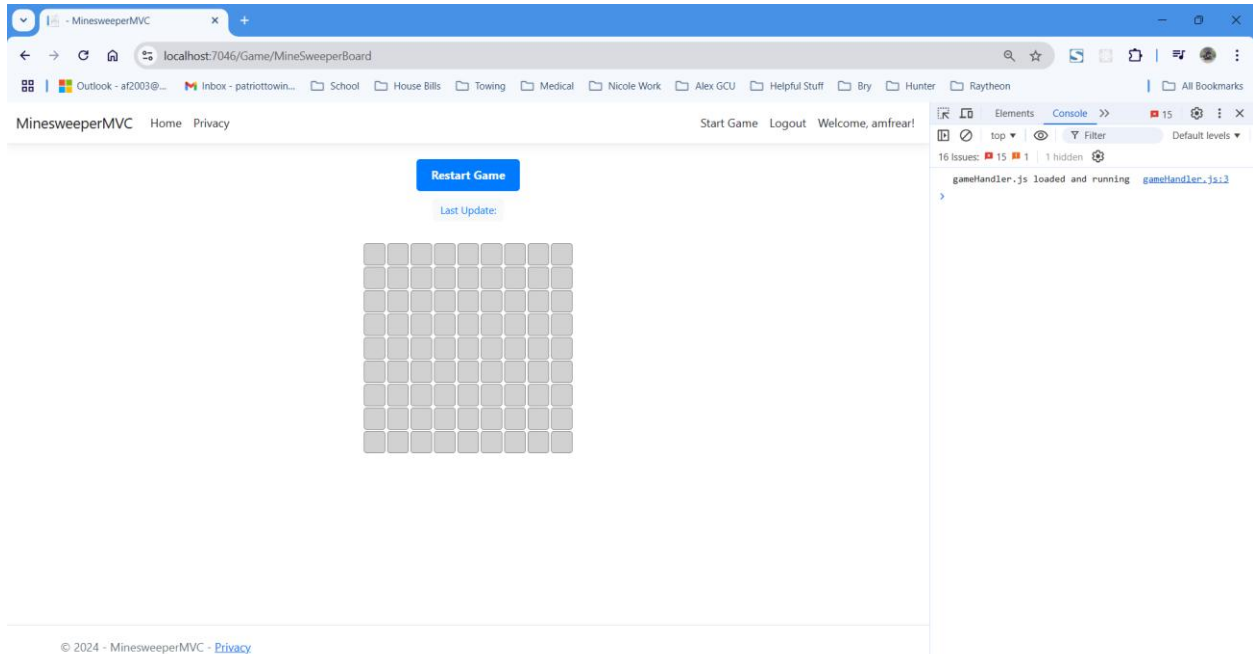


Figure 1 This screenshot shows the initial game board state, ready for user interaction.

2. Partial Update - Left Click (AJAX Floodfill)

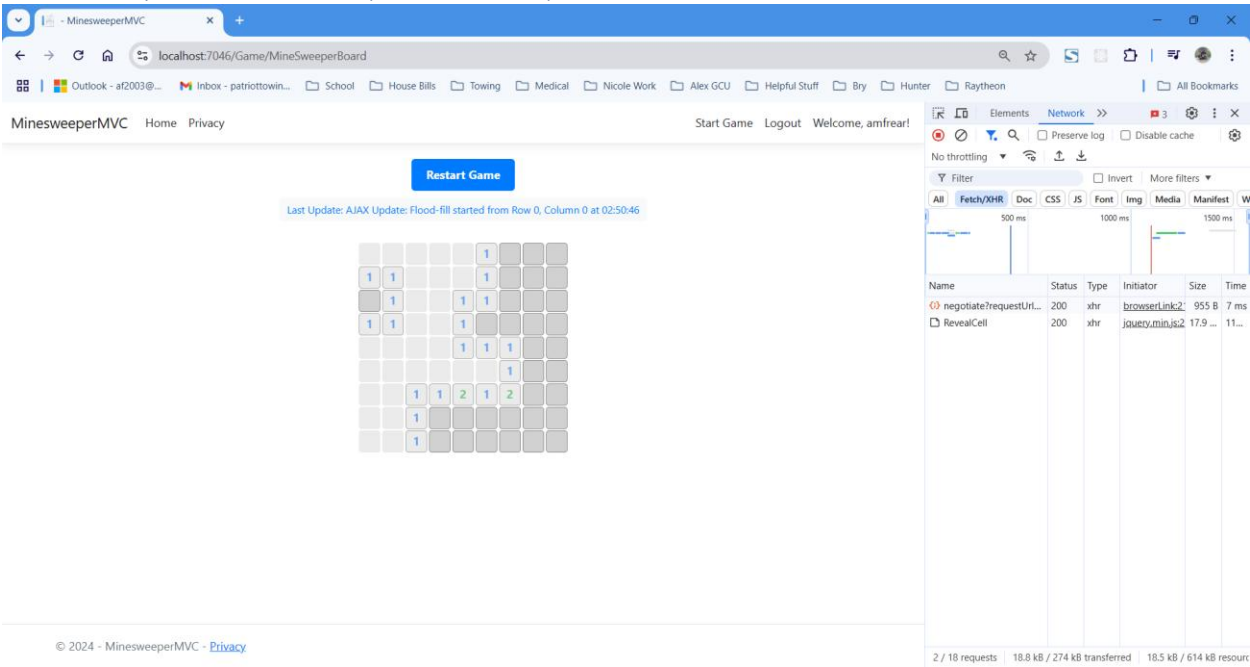


Figure 2 This screenshot demonstrates AJAX dynamically updating the board after a left click that triggered a flood-fill operation.

3. Partial Update - Right Click (AJAX and Flagged Cell)

The screenshot displays a web browser window with the URL `localhost:7046/Game/MineSweeperBoard`. The page title is "MinesweeperMVC" and it includes navigation links for "Home", "Privacy", "Start Game", "Logout", and "Welcome, amfreat!". A "Restart Game" button is visible at the top of the game area.

The game board is a 10x10 grid. The current state shows numbers in several cells, indicating the count of mines in the adjacent cells. A red flag is placed on the cell at Row 2, Column 0. A status message above the grid reads: "Last Update: AJAX Update: Flag toggled at Row 2, Column 0 at 02:54:13".

The network panel on the right shows three requests:

Name	Status	Type	Initiator	Size	Time
negotiate?requestUri...	200	xhr	browserLink-2	955 B	7 ms
RevealCell	200	xhr	jquery.min.js2	17.9 ...	11...
ToggleFlag	200	xhr	jquery.min.js2	17.9 ...	12...

At the bottom of the network panel, it shows: "3 / 20 requests | 36.7 kB / 292 kB transferred | 36.3 kB / 633 kB resourc".

Figure 3 This screenshot shows AJAX dynamically updating the game board after a right-click action to flag a cell.

4. Partial Update - Left Click (Neighboring Mines)

The screenshot displays a web application for MinesweeperMVC. The browser address bar shows the URL `localhost:7046/Game/MineSweeperBoard`. The game interface includes a "Restart Game" button and a status message: "Last Update: AJAX Update: Cell at Row 3, Column 6 revealed with 1 neighboring mines at 02:55:41". The game board is a 10x10 grid. A red flag is placed on the cell at Row 3, Column 6. The cell at Row 3, Column 5 shows the number "1", indicating one neighboring mine. The cell at Row 3, Column 7 shows the number "1", indicating one neighboring mine. The cell at Row 3, Column 8 shows the number "1", indicating one neighboring mine. The cell at Row 3, Column 9 shows the number "1", indicating one neighboring mine. The cell at Row 3, Column 10 shows the number "1", indicating one neighboring mine. The cell at Row 4, Column 5 shows the number "1", indicating one neighboring mine. The cell at Row 4, Column 6 shows the number "1", indicating one neighboring mine. The cell at Row 4, Column 7 shows the number "1", indicating one neighboring mine. The cell at Row 4, Column 8 shows the number "1", indicating one neighboring mine. The cell at Row 4, Column 9 shows the number "1", indicating one neighboring mine. The cell at Row 4, Column 10 shows the number "1", indicating one neighboring mine. The cell at Row 5, Column 5 shows the number "1", indicating one neighboring mine. The cell at Row 5, Column 6 shows the number "1", indicating one neighboring mine. The cell at Row 5, Column 7 shows the number "1", indicating one neighboring mine. The cell at Row 5, Column 8 shows the number "1", indicating one neighboring mine. The cell at Row 5, Column 9 shows the number "1", indicating one neighboring mine. The cell at Row 5, Column 10 shows the number "1", indicating one neighboring mine. The cell at Row 6, Column 5 shows the number "1", indicating one neighboring mine. The cell at Row 6, Column 6 shows the number "1", indicating one neighboring mine. The cell at Row 6, Column 7 shows the number "1", indicating one neighboring mine. The cell at Row 6, Column 8 shows the number "1", indicating one neighboring mine. The cell at Row 6, Column 9 shows the number "1", indicating one neighboring mine. The cell at Row 6, Column 10 shows the number "1", indicating one neighboring mine. The cell at Row 7, Column 5 shows the number "1", indicating one neighboring mine. The cell at Row 7, Column 6 shows the number "1", indicating one neighboring mine. The cell at Row 7, Column 7 shows the number "1", indicating one neighboring mine. The cell at Row 7, Column 8 shows the number "1", indicating one neighboring mine. The cell at Row 7, Column 9 shows the number "1", indicating one neighboring mine. The cell at Row 7, Column 10 shows the number "1", indicating one neighboring mine. The cell at Row 8, Column 5 shows the number "1", indicating one neighboring mine. The cell at Row 8, Column 6 shows the number "1", indicating one neighboring mine. The cell at Row 8, Column 7 shows the number "1", indicating one neighboring mine. The cell at Row 8, Column 8 shows the number "1", indicating one neighboring mine. The cell at Row 8, Column 9 shows the number "1", indicating one neighboring mine. The cell at Row 8, Column 10 shows the number "1", indicating one neighboring mine. The cell at Row 9, Column 5 shows the number "1", indicating one neighboring mine. The cell at Row 9, Column 6 shows the number "1", indicating one neighboring mine. The cell at Row 9, Column 7 shows the number "1", indicating one neighboring mine. The cell at Row 9, Column 8 shows the number "1", indicating one neighboring mine. The cell at Row 9, Column 9 shows the number "1", indicating one neighboring mine. The cell at Row 9, Column 10 shows the number "1", indicating one neighboring mine. The cell at Row 10, Column 5 shows the number "1", indicating one neighboring mine. The cell at Row 10, Column 6 shows the number "1", indicating one neighboring mine. The cell at Row 10, Column 7 shows the number "1", indicating one neighboring mine. The cell at Row 10, Column 8 shows the number "1", indicating one neighboring mine. The cell at Row 10, Column 9 shows the number "1", indicating one neighboring mine. The cell at Row 10, Column 10 shows the number "1", indicating one neighboring mine.

The browser's developer tools network tab shows the following requests:

Name	Status	Type	Initiator	Size	Time
negotiate?requestUri...	200	xhr	browserLink2	955 B	7 ms
RevealCell	200	xhr	jquery.min.js2	17.9 ...	11...
ToggleFlag	200	xhr	jquery.min.js2	17.9 ...	12...
ToggleFlag	200	xhr	jquery.min.js2	17.9 ...	10...
RevealCell	200	xhr	jquery.min.js2	18.0 ...	93 ...

5 / 22 requests | 72.7 kB / 328 kB transferred | 72.1 kB / 669 kB resourc

Figure 4 This screenshot shows the board updated dynamically using AJAX after a left-click action revealed a cell with neighboring mines.

5. Timestamp Demonstration

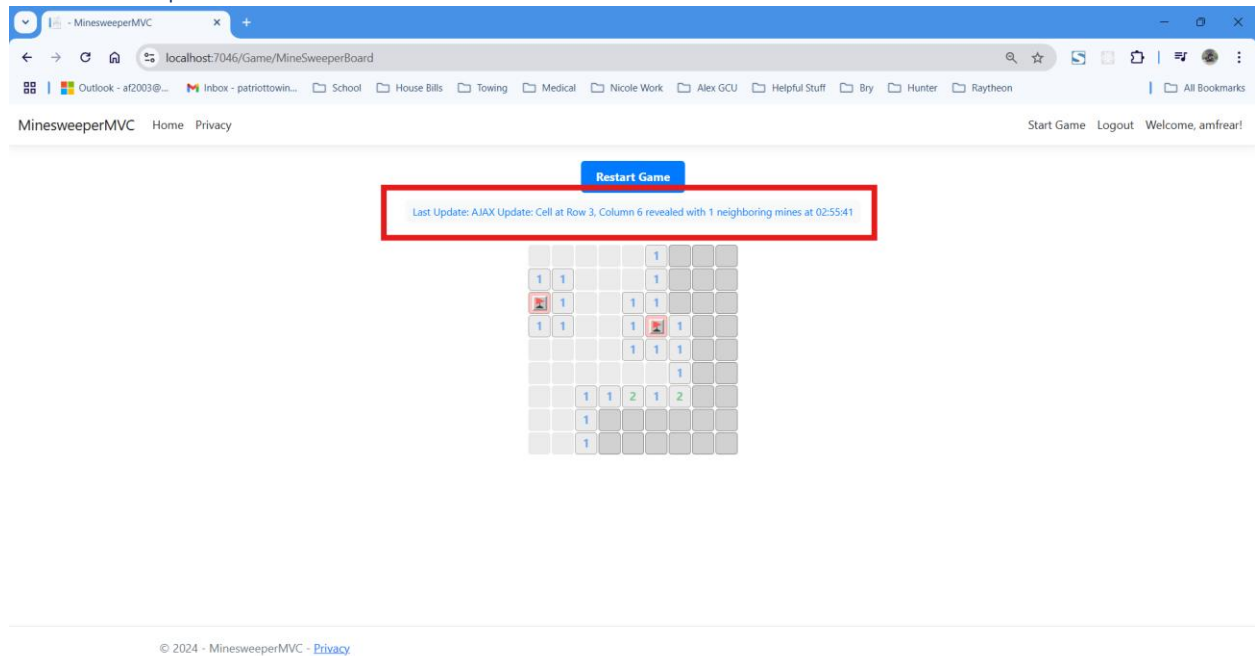


Figure 5 This screenshot highlights the dynamically updated timestamp after a left-click action, showing that AJAX is being utilized.

6. Left Click Prevention on Flagged Cell

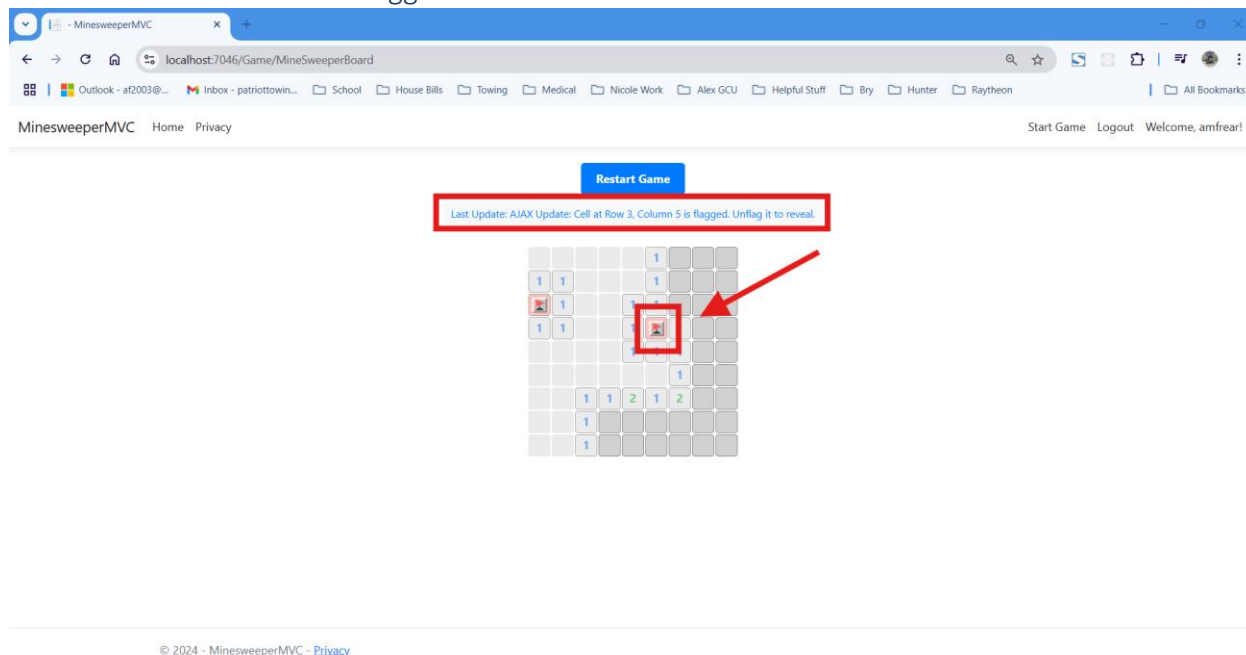


Figure 6 This screenshot demonstrates that flagged cells do not respond to left-click actions, ensuring proper gameplay logic.

7. Game Logic - Loss

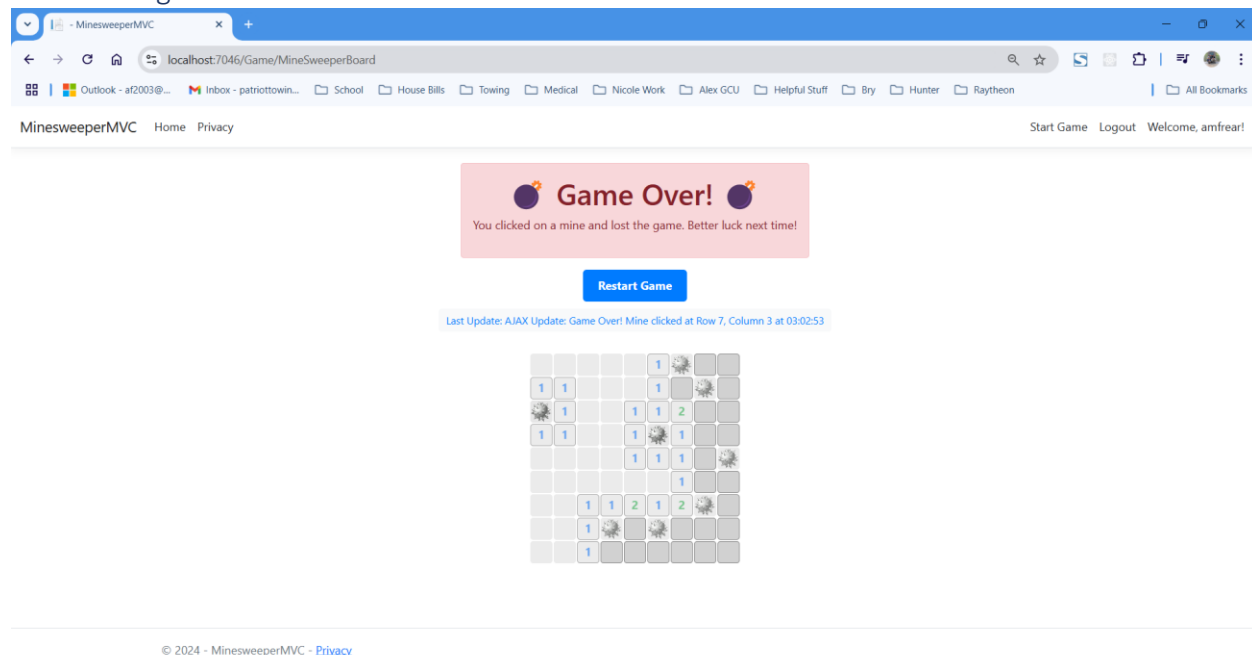


Figure 7 This screenshot shows the Loss message displayed when a mine is clicked. The board reveals all mines as part of the loss condition.

8. Game Logic - Win

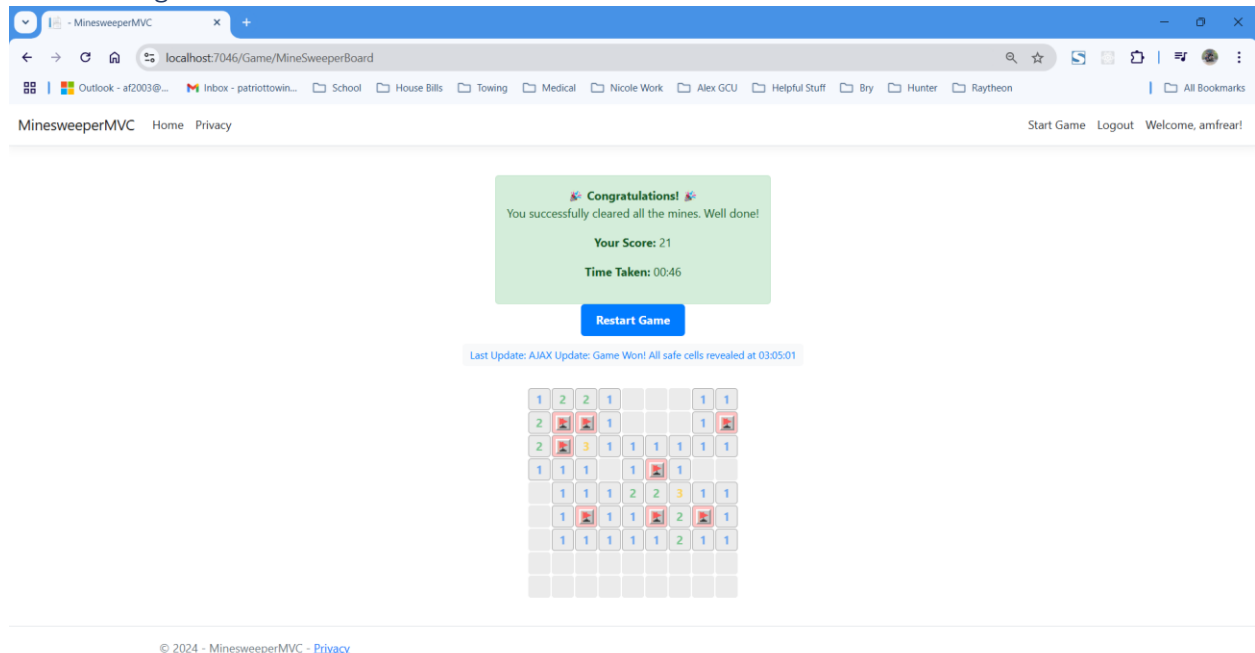


Figure 8 This screenshot shows the Win message displayed when the player clears all safe cells. The score and time taken are dynamically calculated.

Summary of Key Concepts

In Milestone 3, I enhanced the MinesweeperMVC application by incorporating AJAX for Partial Page Updates to create a more dynamic and seamless user experience. This allowed me to update only specific parts of the game board, such as individual cells and timestamps, without requiring a full page reload.

I implemented Right-Click Flagging functionality using JavaScript, enabling users to toggle flags on cells. This feature was designed to ensure flagged cells are excluded from left-click actions, maintaining the integrity of the gameplay. Additionally, I encapsulated the game state logic in a backend service to accurately handle win and loss conditions, ensuring proper functionality and dynamic message displays.

Through this milestone, I focused on creating a responsive and interactive UI by leveraging the MVC architecture and integrating AJAX and JavaScript effectively. These enhancements helped me improve the user experience and demonstrated my ability to implement advanced features within an ASP.NET Core application. This project has provided me with a solid understanding of partial page updates, user interaction handling, and dynamic content rendering, paving the way for future improvements like saving game progress and adding more advanced functionality.