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CS4530: Final Project “Memory Game and Leaderboards”

Our Feature: Memory Game and Leaderboard!

We created a memory testing game that friends can compete for high scores in. Each town would have access to a leaderboard that would display the highest scores achieved in the game for that town. Administrators of the town, currently the creator of the town, can set the default settings of the game like tile color, tile shape, lives, starting board size, etc. Players of the game can also practice in their own custom game with their own settings.

Demo and Source!

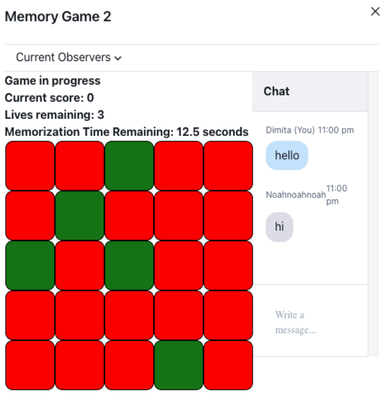
The demo website exists at: https://spring24-project-team-106.onrender.com/
The code base repository exists at:
https://github.com/neu-cs4530/spring24-project-team-106

Our Tech Stack

Much of the techstack remains the same as the base of the Covey.town implementation. We added a seedable random number generator, to help with tile pattern generation for the memorization game board and testing.

Memory Game Design

The frontend design follows a similar design to the other games in the town. There is a controller that connects the view in /frontend to the backend in /townService. Then we have two view components to represent surrounding information based on the state of the game, and the board itself. These rely on the game state values to determine what to render and when. The backend introduces three main changes: MemoryGame.ts, MemoryGameGameArea.ts, and DefaultMemoryGameSettings.ts. We designed the memory game backend to mirror the class structures used by pre-existing games for better readability and maintainability, along with and better cohesion with the rest of the codebase.



Memory Game 2

Game in progress
Current score: 0
Lives remaining: 3
Memorization Time Remaining: 12.5 seconds

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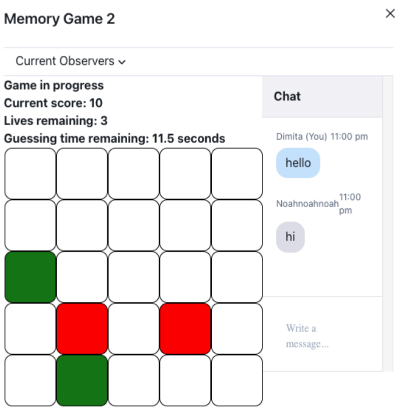
Chat

Dimita (You) 11:00 pm
hello

Noahnoahnoah 11:00 pm
hi



Memory Game 2

Game in progress
Current score: 10
Lives remaining: 3
Guessing time remaining: 11.5 seconds

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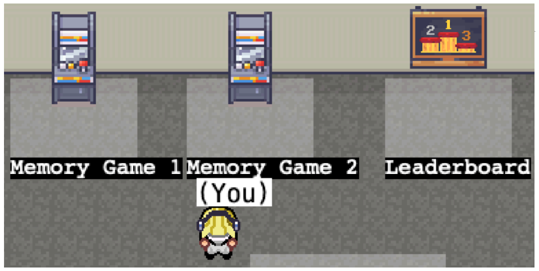
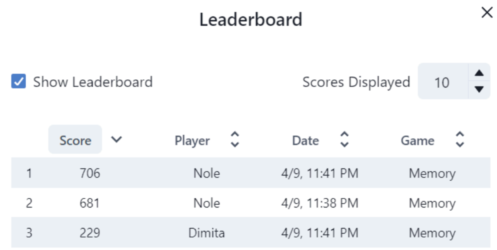
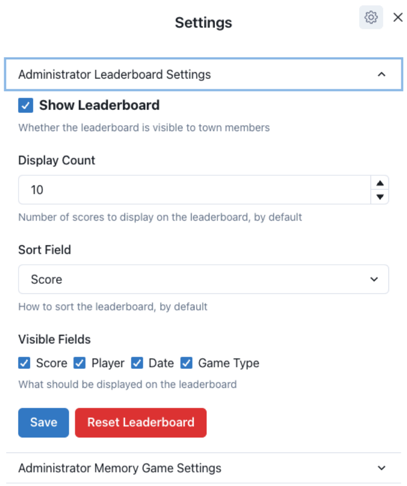




Leaderboard

☑ Show Leaderboard Scores Displayed 10

	Score	Player	Date	Game
1	706	Nole	4/9, 11:41 PM	Memory
2	681	Nole	4/9, 11:38 PM	Memory
3	229	Dimita	4/9, 11:41 PM	Memory



Settings

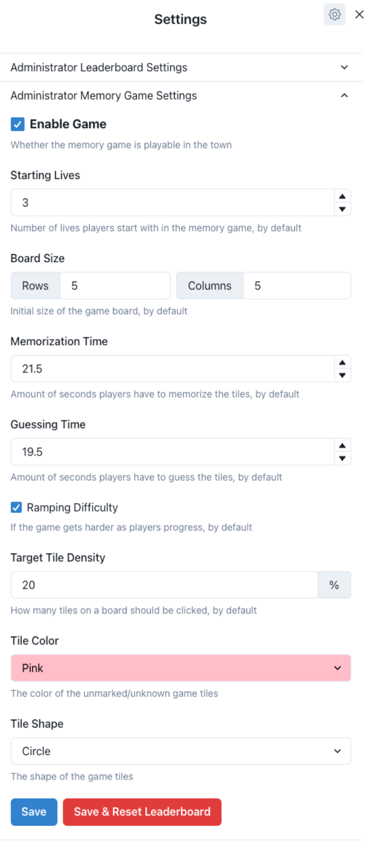
Administrator Leaderboard Settings

☑ Show Leaderboard
Whether the leaderboard is visible to town members

Display Count: 10
Number of scores to display on the leaderboard, by default

Sort Field: Score
How to sort the leaderboard, by default

Visible Fields: ☑ Score ☑ Player ☑ Date ☑ Game Type
What should be displayed on the leaderboard



Settings

Administrator Memory Game Settings

☑ Enable Game
Whether the memory game is playable in the town

Starting Lives: 3
Number of lives players start with in the memory game, by default

Board Size: Rows 5 Columns 5
Initial size of the game board, by default

Memorization Time: 21.5
Amount of seconds players have to memorize the tiles, by default

Guessing Time: 19.5
Amount of seconds players have to guess the tiles, by default

☑ Ramping Difficulty
If the game gets harder as players progress, by default

Target Tile Density: 20 %
How many tiles on a board should be clicked, by default

Tile Color: Pink
The color of the unmarked/unknown game tiles

Tile Shape: Circle
The shape of the game tiles

Leaderboard Design

The leaderboard frontend adds separate controllers for Users and Admins, and separate views for them too. It was implemented as an InteractableArea similarly to ConversationArea or ViewingArea. The leaderboard backend consists of a model and a database. The model is responsible for handling commands given by the controller and emitting an updated model every time something has changed. The database is responsible for holding town-wide shared values and acts like a pseudo-singleton. We did need to change our design a little bit during development to fit better with other parts of the code. Such as the format of scores, and the requirement for a database.

Future Development Areas

One area for improvement would be integrating the other games in covey.town with our leaderboard. Another improvement we can make is being able to add more administrators to a town, as currently, the only administrator is the creator of the town. Design wise, one possible improvement is changing our timekeeping methodology to ensure it always stays synchronized. For future projects, we would also lean more towards continuous integration and more limited testing due to how much we deviated from our original design and how much manual testing we still needed.