Final Project Minesweeper

CS 7580 | Seattle | Summer 2020

Project url: https://minesweeper-7580.herokuapp.com

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Project Description: A two-player minesweeper game.

Minesweeper app functionality

Home screen

Login: When the app is run, users should be prompted to log in. The login button would be disabled unless the user has entered both username and password. When the app is sending the login request to the server for checking, the modal notification will be popped out. Different types of login errors will be alerted: network error, username not exist, password incorrect and duplicated login. The following are **mock user** accounts into the application:

- username: newuser; password: newuser (new user)
- username: expert; password: expert (old user)
- username: user; password: user (old user)

Register: For users don't have an account, they have the option to sign up for a new account. When signing up and typing the preferred username, the backend would check all existing usernames in the database, and provide prompt feedback to help the user quickly pick a unique username. When the user has successfully signed up, the app would head the user to the lobby directly in 2 seconds.

For novice users, the system will display the onboarding slides and they are able to skip reading of the materials. For expert users, they are taken straight into the game lobby, however, they could click the help button in the menu to access the onboarding.

Lobby:

Dropdown Menu: Users can use the dropdown menu either to use help to go through an onboarding process again or log out the app.

Lists: notifications from the server about all login and logout notifications, all online players list with an actionable button.

- The online player have three gaming status:
  - Available: the player is available to send an invitation.
  - Pending: meaning the player is either sending out an invitation or receiving an invitation.
  - In a game: the player is currently playing a game.
- The user can send a gaming invitation to one of the available online players. The system will prompt notifications for the invitation process:
  - sending to server
  - waiting the receiver's feedback
  - the receiver accepts or declines the invitation.
- If the invitation is successfully sent to the receiver via server, the two players would be Pending until the receiver makes his decision.
- If the invitation is accepted, the two players would receive pair up feedback and the system would head them directly into the game in 1 seconds and change the gaming status of the two to In a game.
- If the invitation is declined, the two players would receive feedback and the system will automatically close the notification and head them back to lobby.
- Offline: if any of the sender-receiver players is offline when an invitation is pending, the invitation would be regarded as declined and head the online player back to lobby.

Game:

When the board displays, self and pair players can see the same board synchronously.

- If the self player is assigned a red color, the pair player will be assigned a green color.
- If a player left clicks a grid without mine, the grid will be highlighted bordered with the given player color, and reveal the hidden value.
- If a player right clicks a grid, the grid will be placed a flag with the given player color, the player can right click again to unflag. The player can unflag the pair's flags as well via right click.
- If a player left clicks a grid with mine, the grid will be exploded, the whole board will be revealed, the game is over.

For mine counts:

- When a player flags a grid, the mine count will decrement by 1,
- When a player unflag a grid, the mine count will increment by 1.
- In all conditions, the mine count will not be out of range [0, 10].

For game results:

- When a player clicks a mine, the game is ended, the player loses, and the pair player wins immediately.
- When a player places the last flag, and all other unflagged grids are revealed, the player wins, the pair player loses immediately.
- The game will be in progress if the flags are used completely, but the grids are not revealed completely.
- Offline: when one player is offline during the game, the pair player will win the game directly.
- When the game ends, the two players will receive result notifications and they need to click back to the lobby button to exit the game.

Reference:

https://codeburst.io/learning-react-js-by-building-a-minesweeper-game-ced9d41560ed

Limitations

- We didn't make the app fully accessible, especially for the visually impaired users.
- We made our game responsive, but it cannot support well for mobile users, especially for the table content display of online player lists.
- When handling checking existing usernames while signing up, the system is now checking every change of the input, we could check every one minute or so to reduce frequent database queries.
- We didn't add private chatting for the online players.
- The invitation send and receiver can now only have one role: either send or receive the invitation.
- The invitation sender cannot cancel the invitation.
- When a user is offline with pending invitation or current game, the pair received the same notification as the offline user declined or losed the game. The pair player can only get the offline information when he looks at the system notification. Could implement more to improve more accurate feedback.
- We didn't place an exit button in the gaming board.

- We didn’t allow the player to continue another round play with the current pair, they need to exit the current round, and invite each other again to play another new round.

Peer Feedback

- Can provide a chatting room for the online players.
- Can improve from 1v1 game to multiplayer games, with more players having different color flags to differentiate.
- Can have the players customize the minesweeper board, either a quick small board game or large board for long-time playing and supporting more players for a game (even be a large map while each player is playing a part of it and having navigation supported).
- Can support the player to exit during a game.
- Can support solo games.