Team 5 - Product Backlog
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Problem Statement

The problem we are trying to solve is to create an online Battleship game encompassing both single player and multiplayer elements where other Battleship games do not have. Our application will provide a single player game with two difficulties based on specific algorithms along with necessary user interface features including a functioning grid for your ships and the opposing player, which would include ship placement, record of hits and misses, and attack selection. Furthermore, users will create an account to have access to leaderboards, multiplayer with both public and private lobbies that are joinable, and a chatroom. These ideas and structures will accomplish the task of building a full and complete Battleship game which others lack.

Background Information

Board games are always fun to play, and with many board games being hosted on the internet, we can don't even need to own a game to be able to play it. However, a problem that has always existed is: What if you don't have anyone to play with? Or what if you want to practice by yourself and then play with others to test out your skills? Our Battleship application will solve this problem. Although current solutions to online Battleship have either a single player mode or a multiplayer mode, our application will include a single player mode with easy and difficult modes, a multiplayer mode that you can play with both friends and strangers, and many other features such as a player-to-player chat and leaderboard. In short, our application will be an all encompassing, one-stop-shop game where you can play in a variety of ways.

Similar Applications

Battleship is similar to both the board game and online computer games versions. The problem with the original board game is that the two people playing must be in the same room. If two people want to play Battleship but are in different locations, they will not be able to play. Our Battleship aims to solve this issue by having the feature of public and private lobbies for users to connect and play in. Public lobbies will be open to anyone to join in and play. Private lobbies will have a generated key to share with a friend, so you can directly play with them without interruptions. An example of an online Battleship would be from battleship-game.org. Here, the GUI is too simple and boring as well as having no single player option. Our game will contain an aesthetic GUI along with a single player mode with two difficulties. The single player mode is a critical improvement upon our version as very few online Battleship games contain solo mode.

Environment

Technologies that we will be using include a MySQL database with a backend server written in Node.js. The front end application will be written in Javascript and will use CSS stylesheets. We will also be using libraries from Bootswatch.com for navigation bars and other stylistic components. We will be using WebStorm as our IDE.

Functional Requirements

Backlog ID	Functional Requirement	Hours	Status
1.	As a user, I would like to sign up for an account	4	Planned For Sprint 1
2.	As a user, I would like to sign out of my account	4	Planned For Sprint 1
3.	As a user, I would like to sign in to my account	3	Planned For Sprint 1
4.	As an administrator, I would like to have the ability to view,	4	Planned For Sprint 1

	delete, and create users in the backend.		
5.	As a user, I would like to have the ability to change my password.	3	Planned For Sprint 1
6.	As a user, I would like to have the ability to terminate my account.	3	Planned For Sprint 1
7.	As a user, I would like to be greeted with the option to select single player or multiplayer on the homepage.	5	Planned For Sprint 1
8.	As a user, I would like to have two modes of single player where I can play the computer on 'Easy' or 'Hard'.	8	Planned For Sprint 1
9.	As a user, if I decide to leave my game I will be warned with a popup if I would like to leave.	3	Planned For Sprint 1
10.	As a user, if I leave my game I would like my departure to be counted as a forfeit.	3	Planned for Sprint 1
11.	As a user, if I select single player, I would like to be able to see a game board that includes a hit screen, game board, and ships.	10	Planned For Sprint 1
12.	As a user, if I start a game, I would like to be able to select a ship and place it on the game board.	4	Planned For Sprint 1
13.	As a user, if I click on a ship, I would like to be able to place it on the game board	4	Planned For Sprint 1
14.	As a user, if I click on a placed ship, I would like to be able to change the orientation of a ship.	3	Planned For Sprint 1
15.	As a user, if I have finished	2	Planned For Sprint 1

	placing a ship, I would like to be able to press a confirm button to keep in in place while I move on to place another ship..		
16.	As a user, if I have not confirmed a ship's position, I would like to not remove the preview's position by clicking on another ship	2	Planned For Sprint 1
17.	As a user, if I have finished locking my ships, I would like to be able to press a button to start the game.	2	Planned For Sprint 1
18.	As a user, if I click on the opponent's game board, I would like to be able to see if my attack hit or miss the opponent's ships.	3	Planned for Sprint 1
19.	As a user, if my opponent has attacked, I would like to see on my game board where they attacked and if they hit my ship.	3	Planned for Sprint 1
20.	As a user, if I destroy all of my opponent's ships, I would like for my victory to be declared.	2	Planned for Sprint 1
21.	As a user, if I complete a game, I would like to be directed back to the home screen.	2	Planned for Sprint 1
22.	As a user, if I don't know the rules, I would like to be able to read them from the site.	3	Planned for Sprint 2
23.	As a user, If I want to play with another person, I would like to be able to select multiplayer from the homepage.	3	Planned for Sprint 2
24.	As a user, after I have clicked multiplayer on the homepage, I would like to be able to choose to host a private game.	5	Planned for Sprint 2

25.	As a user, after I have clicked multiplayer on the homepage, I would like to be able to choose to host a public game.	5		Planned for Sprint 2
26.	As a user, if I want to play a private game, I would like to be able to play a game against the computer.	2		Planned for Sprint 2
27.	As a user, if I want to host a private multiplayer game, I would like to be provided with a game key that I could give to someone else.	3		Planned for Sprint 2
28.	As a user, if I want to join a private multiplayer game, I would like to be able to put in a provided game key to join another person's game and play against them.	5		Planned for Sprint 2
29.	As a user, if I don't care who I play with, I would like to be able to join a public lobby.	5		Planned for Sprint 2
30.	As a user, if I win or lose a game against another person, I would like it to be recorded in my profile.	2		Planned for Sprint 2
31.	As a user, if I feel like I played well in a game, I would like to see the statistic of my previous games in my profile.	5		Planned for Sprint 2
32.	As a user, if I want to know where I rank in a list of all players who have played on the site, I would like see a leaderboard containing all players.	6		Planned for Sprint 2

Non-Functional Requirements

Security

Security is an inherently important aspect of Battleship because of the personal information held in each user's account. Fortunately, we'll be using MySQL and Google authentication for our backend and login services so most of the heavy lifting is off of our shoulders. Users can be confident their authentication data is safe with Google. However, we will still have to ensure a tight experience by programming carefully and methodically. For example, while MySQL itself is secure from outward hacking attempts, we will have to implement a permissions system ourselves to ensure users can access only what they are allowed to. Some user information will be shared with team members, while other information should be private.

Usability

The core idea of our app is not complex, as it is a simple board game in the end. We also plan to have the user interface as simple as well. We plan to guide the user through the simple gameplay mechanics with our intuitive front-end layout. We also want to make signing up as simple as possible, so users can jump in and play right away. A user interface with the personal and opposing grids along with the ship placement and hit or miss detection will allow for a more pleasant user experience.

Performance

With our application, performance is key for the success of our game. Except for the user's personal information (username and password) and the user's game statistics, all other data will be stored in cookies. This will allow game data to be retrieved and changed very easily and quickly. We will store very little information in our SQL database in order to minimize time spent on queries.

Reliability

Reliability is key to the success of Battleship. Our users need to be able to get their game started and play with others. We are implementing MySQL and Node.js to help improve reliability. Both of these structures will help improve uptime. The single player version will almost have no connection issues.

Use Cases

Backlog ID	Functional Requirement	Action	System Response
1.	As a user, I would like to sign up for an account	1. Click Sign Up button 3. Enter username and password 4. Click Confirm	2. Redirects to popup window 5. User is added to database
2.	As a user, I would like to sign out of my account	1. Click Sign Out button	2. User is signed out of game, redirect to sign in page
3.	As a user, I would like to sign in to my account	1. Click Sign In button 3. Game homepage is displayed	2. Game homepage graphics are loaded
4.	As an administrator, I would like to have the ability to view, delete, and create users in the backend.	1. Open up database 3. Add, delete, create users by clicking appropriate buttons	2. Database opens 4. Add, delete, creature user entries in database
5.	As a user, I would like to have the ability to change my password.	1. Click Change Password button 3. User changes password 4. User clicks Confirm	2. Change password dialogue box opens 5. Password is changed
6.	As a user, I would like to have the ability to terminate my account.	1. Click Terminate Account 3. Click Confirm Delete button	2. Confirmation dialogue box appears 4. Account is deleted from database

7.	As a user, I would like to be greeted with the option to select single player or multiplayer on the homepage.	1. Click Sign In button 3. User has the option to click on a single player or multiplayer mode	2. Game homepage is opened 4. Single or multiplayer is opened dependent on user
8.	As a user, I would like to have two modes of single player where I can play the computer on 'Easy' or 'Hard'.	1. Click Sign In button 3. User clicks single player button 5. User clicks either Easy or Hard button	2. Home page is loaded 4. Single player is loaded
9.	As a user, if I decide to leave my game I will be warned with a popup if I would like to leave.	1. User clicks exit button to leave game	2. Popup with warning is displayed to user
10.	As a user, if I leave my game I would like my departure to be counted as a forfeit.	1.User clicks exit button 3.User clicks yes to exit	2. Popup appears with option 4. Database is updated with loss for player leaving
11.	As a user, if I select single player, I would like to be able to see a game board that includes a hit screen, game board, and ships.	1.User clicks single player button 3. User chooses difficulty setting	2. Single player mode loads 4. AI is loaded and game is grid is displayed with everything included
12.	As a user, if I start a game, I would like to be able to select a ship and place it on the game board.	1.User chooses difficulty 3. User has the option of selecting a ship and area to place it in	2. Grid is loaded 4. Game is updating with ship graphic and gameplay wise
13.	As a user, if I click on a ship, I would like to be able to place it on the game board	1. User clicks on ship and places it on the game board	2. Graphics are updated to match ship in area
14.	As a user, if I click on a placed ship, I would like to be able to change the orientation of a ship.	1. User clicks on ship they want to change and selects orientation wanted	2. Graphics are updated to match new orientation
15.	As a user, if I have finished	1. User completes	2. Game starts and

	placing my ships, I would like to be able to press a button to start the game.	set up and presses "start" button	player who started the game initially starts off the round
16.	As a user, if I click on the opponent's game board, I would like to be able to see if my attack hit or miss the opponent's ships.	1. User clicks on the target board	2. A red dot appears on the target board if it hits the opponent's ship 3. A white dot appears on the target board if it hits the opponent's ship
17.	As a user, if my opponent has attacked, I would like to see on my game board where they attacked and if they hit my ship.	1. Opponents clicks on his target board to apply a "hit"	2. A red dot appears on my board if it hits a ship 3. A white dot appears on my board if it misses a ship
18.	As a user, if I destroy all of my opponent's ships, I would like for my victory to be declared.	1. User destroys all of opponents' ships	2. Victory message appears
19.	As a user, if I complete a game, I would like to be directed back to the home screen.	1. User completes game	2. Redirects user to home screen
20.	As a user, if I don't know the rules, I would like to be able to read them from the site.	1. Click Rules button 3. Click "X"	2. Dialogue box with rules appears 4. Dialogue box disappears
21	As a user, If I want to play with another person, I would like to be able to select multiplayer from the homepage.	1. Click Multiplayer button	2. Redirected to screen with two more buttons for hosting public/private multiplayer game
22.	As a user, after I have clicked multiplayer on the homepage, I would like to be able to choose to host a private game.	1. User clicks Host a Private Game button	2. Redirected to multiplayer game screen where key will be generated
23.	As a user, after I have clicked multiplayer on the homepage, I	1. User clicks Host a Public Game button	2. Redirected to waiting screen until

	would like to be able to choose to host a public game.		another player joins
24.	As a user, if I want to play a private game, I would like to be able to play a game against the computer.	1. User clicks Play Against Computer button	2. System loads single player game against AI
25.	As a user, if I want to host a private multiplayer game, I would like to be provided with a game key that I could give to someone else.	1. User clicks Create Game 3. User waits for another player to join the game	2. Game key created by system, linked to specific game
26.	As a user, if I want to join a private multiplayer game, I would like to be able to put in a provided game key to join another person's game and play against them.	1. User enters game key 2. User clicks Confirm	3. User joins game associated with key. 4. Game begins
27.	As a user, if I don't care who I play with, I would like to be able to join a public lobby.	1. User clicks Join Random game	2. User is matched with another player in queue who is also waiting for a game 3. Game board is loaded for each player and game begins
28.	As a user, if I win or lose a game against another person, I would like it to be recorded in my profile.	1. User wins a game 3. User loses a game	2. Win total incremented in database 4. Loss total incremented in database
29.	As a user, if I feel like I played well in a game, I would like to see the statistic of my previous games in my profile.	1. Click statistics button under player profile 3. Click "X"	2. Statistics dialogue box appears 4. Dialogue box disappears
30.	As a user, if I want to know where I rank in a list of all players who have played on the site, I would like see a leaderboard containing all players.	1. Click leaderboard tab	2. Leaderboard page is displayed