



# **Software Documentation**

## **TEAM 4**

### **CMP 408**

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## **Introduction**

This introduction provides an overview of the System Architecture Document for Logs Cabin. It includes the purpose, scope, target audience, design approach, main component design and high level system design considerations of the system.

## **Document Scope and Purpose**

This document provides a description of the technical design for Logs Cabin. This document's primary purpose is to describe the technical vision for how business requirements will be realized. This document provides an architectural overview of the system to depict different aspects of the system. This document also functions as a foundational reference point for developers. Please note that this is a baseline document and may be updated as development progresses.

## **Target Audience**

This document is targeted (but not limited) to technical stakeholders:

\*Development Team

It is assumed that the reader has a technical background in software design and development.

## **System Environment**

- Front End: JavaScript (React.js Framework)
- Server: Python
- Database: PostgreSQL
- Text Editor: Visual Studio Code
- Version Control: Git & GitHub

## **Development Process**

### Agile Software Development

- Offers rapid development and delivery
- Flexibility in our system by having multiple approaches on the creation of components that make up the system

## **Clients Requirements**

### **Genre of Game:**

- Board Game similar to Monopoly

### **Platforms:**

- Web browser (tailored for tablets)

### **Players:**

- 2 players - 6 players

### **Session features:**

- Having an account is required to begin a session , resume a session, or join a session .
- A game session will last until one player wins, so a session can last indefinitely.

### **Game features:**

- From a random or player specified zip code, the board game will display real-time properties (housing and commercial), street names , and avenue names .
- More expensive property will be available turns the end of the board.

### **Gameplay features:**

- Bank : will be AI/CPU controlled to manage loans to players and purchasing of player led property sales .
- Mortgages : players will be able to mortgage homes.
- Purchases : players will be able to purchase properties for sale and purchase properties that were lost .
- Properties for sale: Housing , Commercial , and utilities .
- Loans : Players will be able to take out loans from the bank.
- Jail : Players will have a chance to be set back to a certain point in the boardgame in order to pay a random fine
- Railroads : Will be random utility companies that players can buy stocks in, and the more the player owns the more profit the player can collect for each turn.
- Can own stocks in the following utilities: electricity, gas, water, or sewerage

- Free Parking : A tile where the player who lands there receives all the money from paid fines.

### **Rules:**

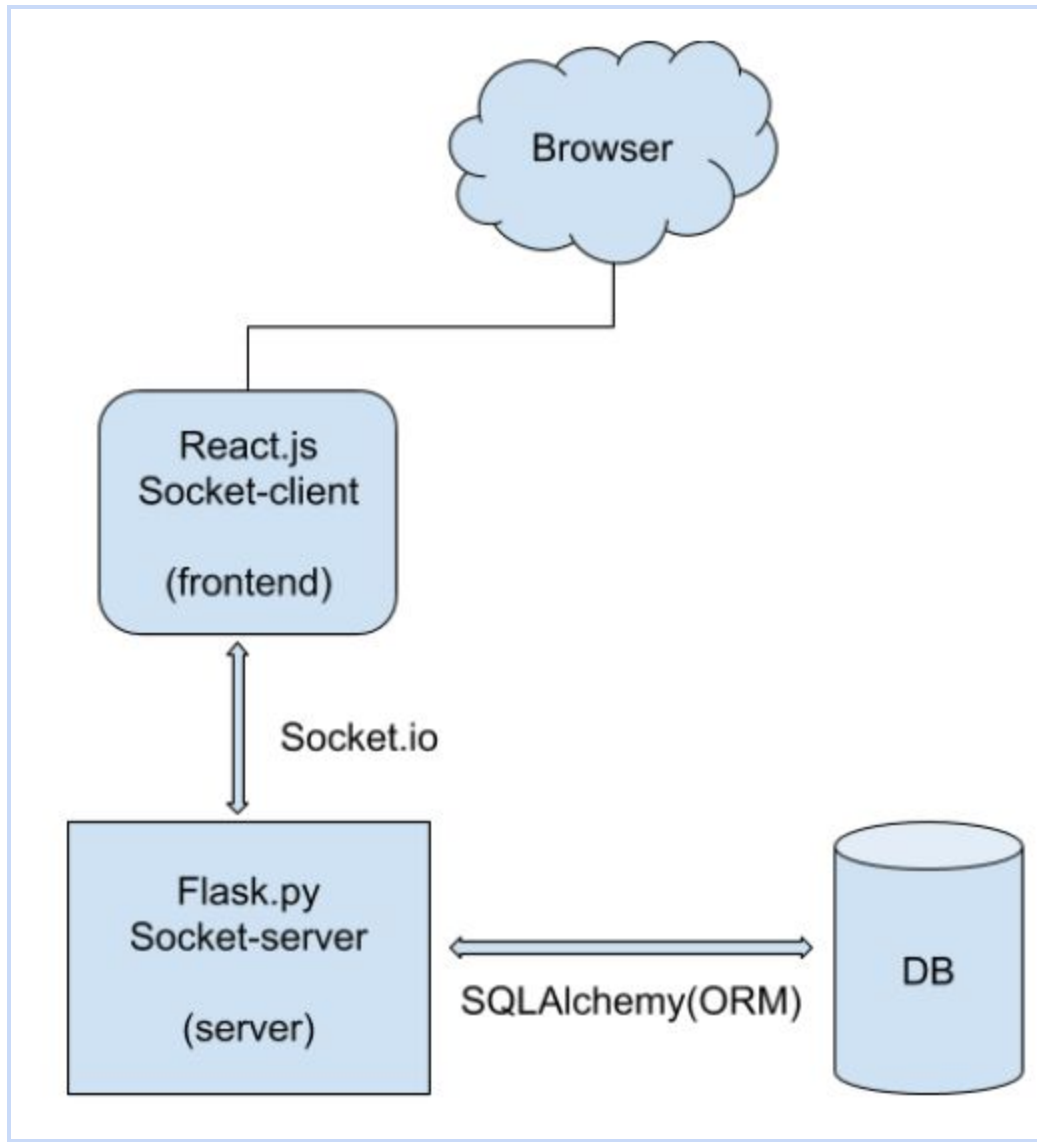
- Property ownership limitations:
  - Only 4 house maybe owned by one player. (Max upgrade level is 4)
  - No limit on commercial real estate. (Max upgrade level is 4)
- Setup prior to first turn
  - All player's order will be randomly decided.
  - All players will receive a set amount of funds
  - Player's amount of moves are randomly decided without any dice animation, which will be done for every turn.
- Player's turn
  - [ Mandatory ]
    - Players will have to pay their mortgage.
    - Players will forfeit their property to the bank if they can't pay their property's mortgage for that turn.
    - Players will have to pay rent if they land on another player's property
    - Players will have to go back to the "Jail" tile and pay a fine if they land on a "Go to Jail" tile.
    - Players will receive money for landing on the "Free Parking" tile, the money will be from all paid fines or x amount if there are no fines paid so far.
    - Players will lose if they have no properties and insufficient funds to make any decisions.
    - Players will have to roll the dice after they have done what they wanted and haven't loss.
  - [ Optional ] (THIS OCCURS BEFORE ROLLING)
    - Players can purchase or mortgage properties if the player has sufficient funds.
    - Players can sell off property to the bank.



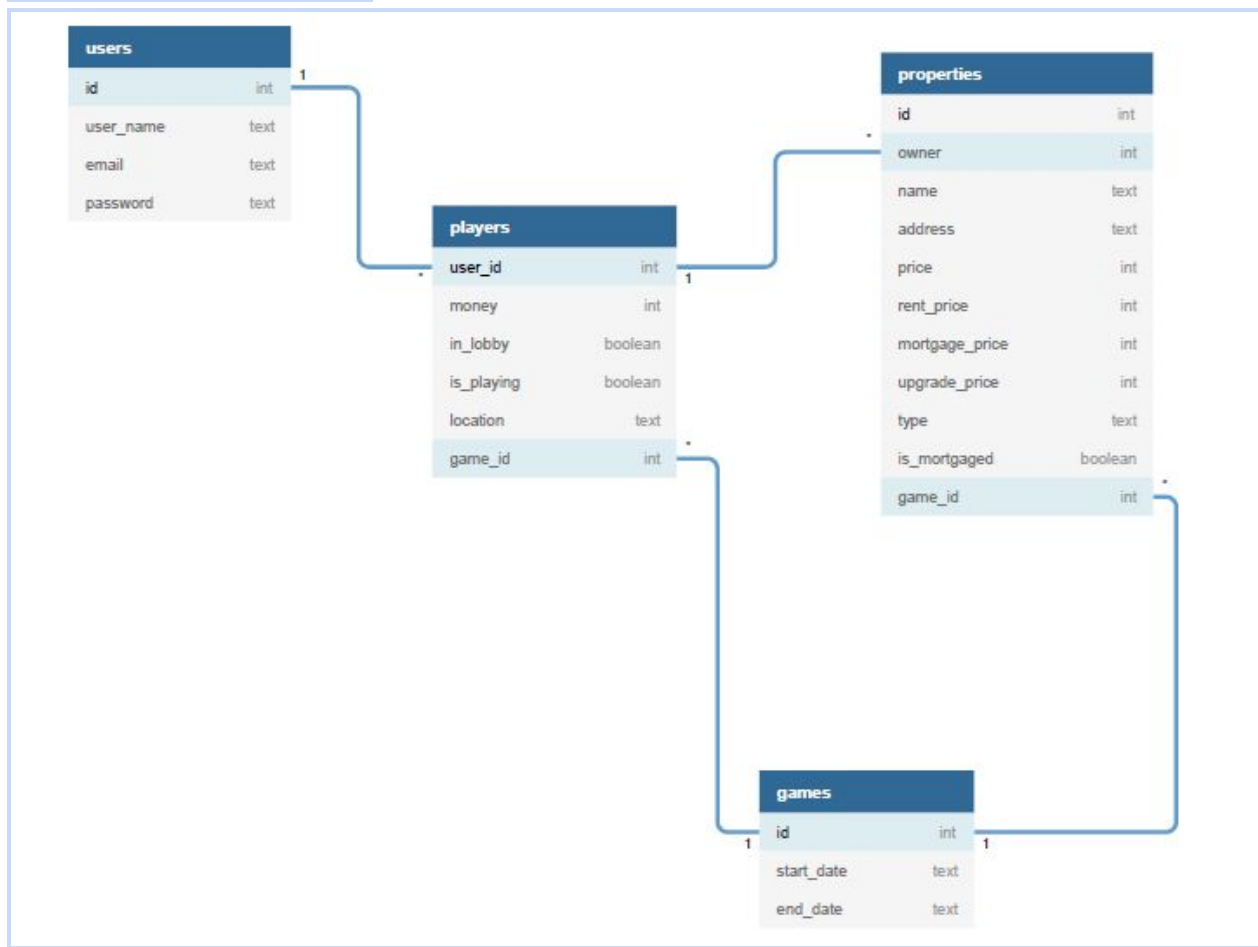
- Players who lands on an owned property can offer to buy that property or swap properties.
- Ending the game
  - The game will end if one player remains since all other players would have lost to bankruptcy.

## Designs

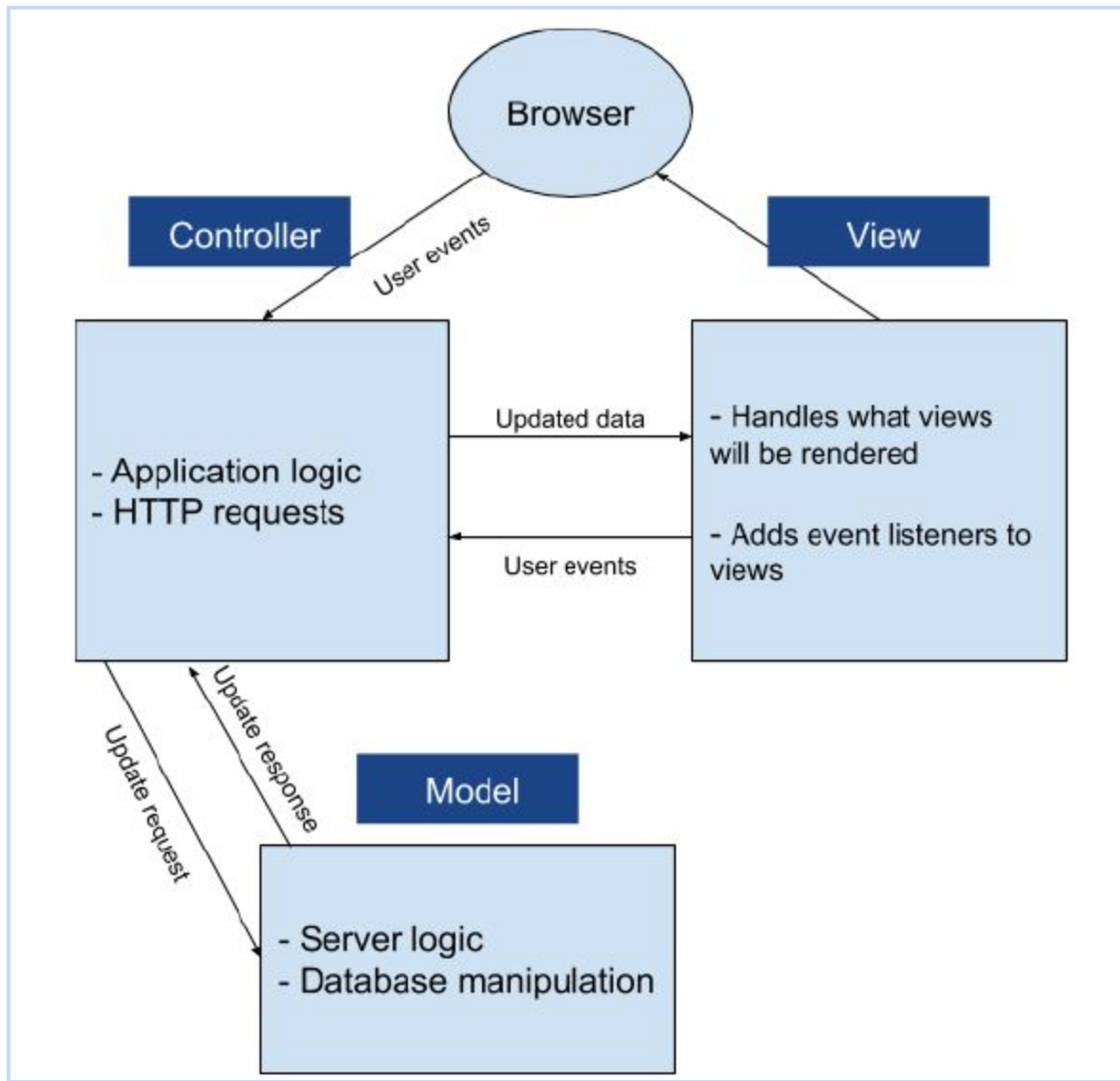
### Architecture Design



## Database Schema



## MVC Pattern



# Tile Design

The diagram illustrates a tile design system. At the bottom center is a 2x2 grid of tiles. The top row contains 'Home' and 'Commercial'. The bottom row contains '123 Hello Ave.' and '321 World Ave.'. The middle two rows of the grid are blue and represent the 'Tile info (displayed on the board)'. Two large blue arrows point from the top corners of the grid to two 'Hovering info' panels. The left panel shows 'Level 1' and 'Rent: \$1,500'. The right panel shows 'Level 4' and 'Rent: \$10,000'. Both panels have a blue bottom section.

Hovering info	
Level 1	
Rent: \$1,500	

Hovering info	
Level 4	
Rent: \$10,000	

Tile info (displayed on the board)	
Home	Commercial
\$65,000.00	\$150,000.00
123 Hello Ave.	321 World Ave.

**Player:** MoneyBags      **Turn:** Francis C.

The board is a square grid with a central area. The central area is a large square with a light blue background, containing the text "Log Cabin" in a stylized font and "Log in or lose out" below it. Surrounding the central area is a grid of property cards. The cards are arranged in a 10x10 grid, with the central area occupying the middle 4x4 grid. The cards are color-coded: light blue for "House", light green for "Stocks", and light orange for "Commercial Utilities".

**Legend:**

- House (light blue square)
- Stocks (light green square)
- Commercial Utilities (light orange square)

**Fortune:** The top-left corner of the board, containing a large blue square with the word "Fortune" in white.

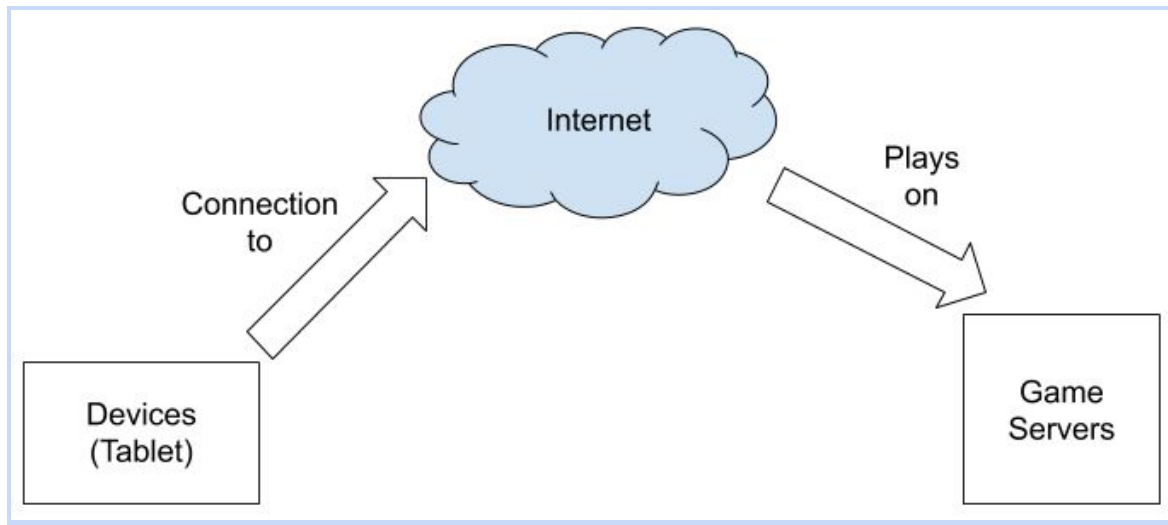
**Misfortune:** The bottom-left corner of the board, containing a large red square with the word "Misfortune" in white.

**Start:** The bottom-right corner of the board, containing a large blue square with the word "Start" in white and a black arrow pointing left.

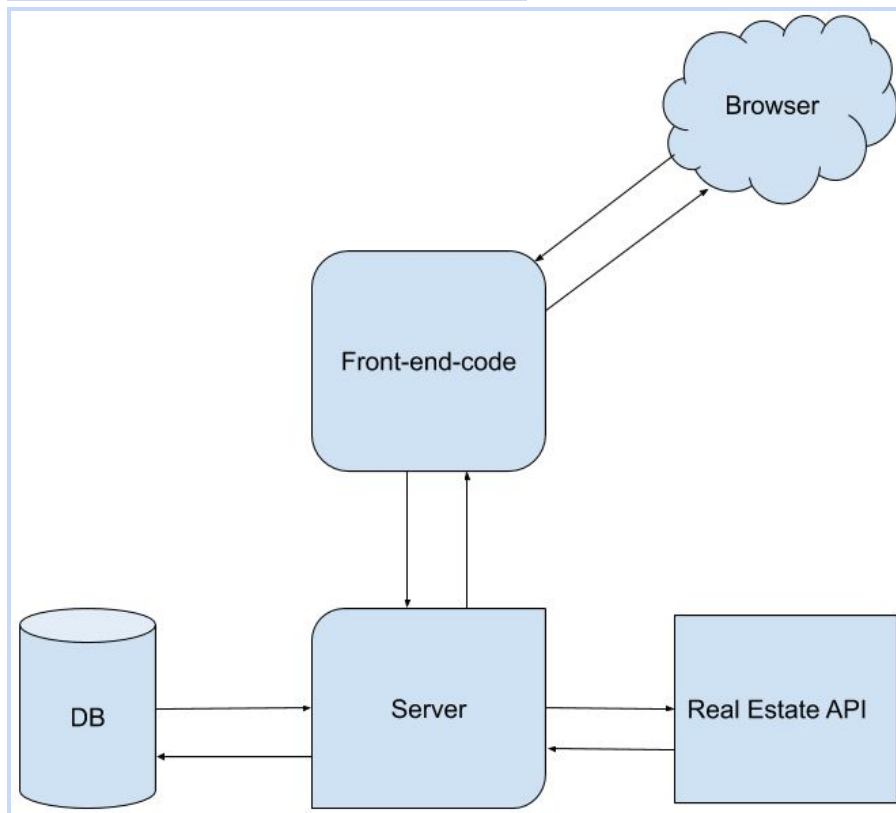
**Property Cards:** The board is divided into four quadrants by the central area. Each quadrant contains a 5x5 grid of property cards. The cards are arranged in a grid, with the central area occupying the middle 4x4 grid. The cards are color-coded: light blue for "House", light green for "Stocks", and light orange for "Commercial Utilities".

**Player Information:** The top of the board displays the player's name "MoneyBags" and the current turn "Francis C."

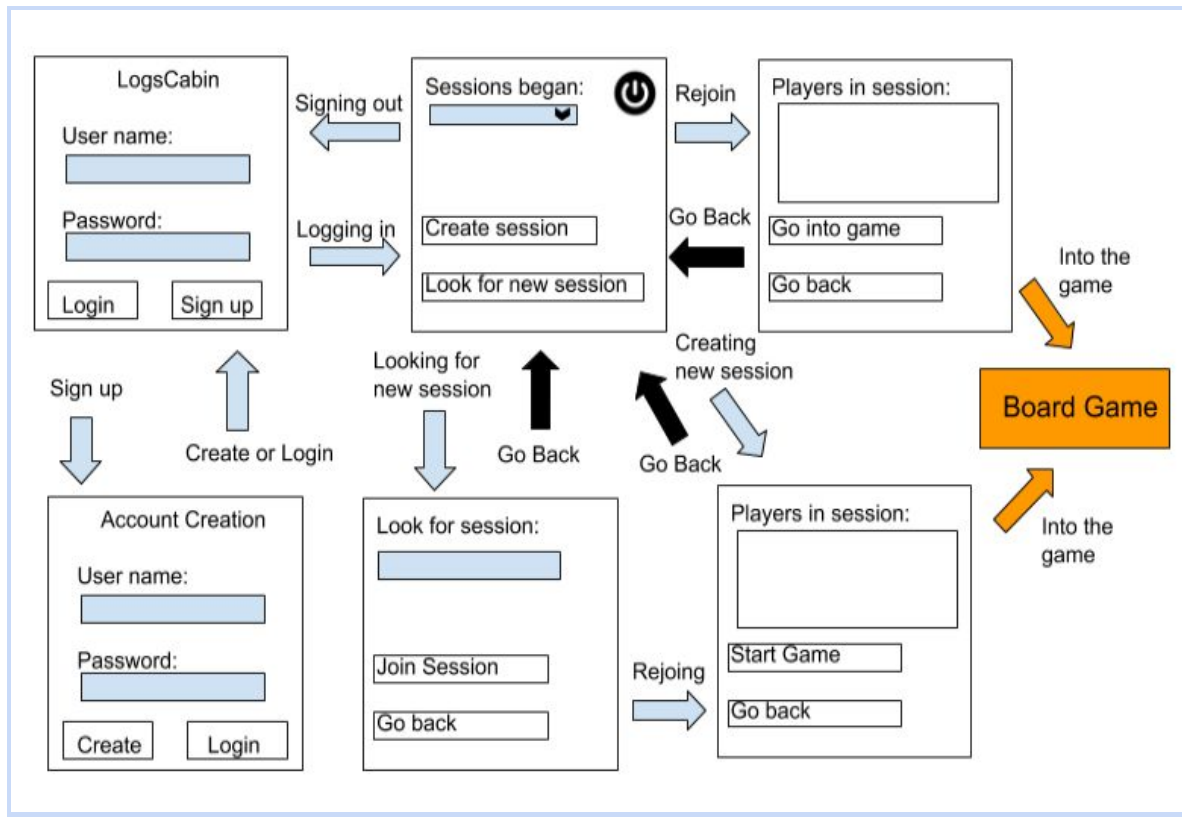
## Concept View



## Conceptual Process View



## Users Navigation



## Screenshots

The image displays two side-by-side screenshots of the LogsCabin web application interface. Both screenshots feature the 'LogsCabin' logo in a stylized purple font at the top, with the tagline 'Log in or lose out' below it.

The left screenshot shows the 'Login' section. It includes a 'Username' label above a text input field with the placeholder 'Enter Username', and a 'Password' label above a text input field with the placeholder 'Enter Password'. A dark grey 'Login' button is positioned below the password field. At the bottom of the page, there is a purple 'Rules' button on the left and a 'Sign up' link on the right.

The right screenshot shows the 'Choose' section. It features three large black buttons stacked vertically: 'New Game', 'Resume Game', and 'Join Game'. At the bottom of the page, there is a purple 'Rules' button on the left and a 'Log Out' link on the right.



## Revisions

### Document History

Document Number	Version	Date	Document Name
1	1	10/25/2019	Clients Requirements
2	2	10/30/2019	Clients Requirements 2
3	1	10/30/2019	Architecture Design
4	3	11/06/2019	Clients Requirements 3
5	1	11/06/2019	Database Schema
6	1	11/06/2019	MVC Pattern
7	1	11/13/2019	Tile Design
8	1	11/13/2019	Concept Design
9	1	11/13/2019	Conceptual Process View
10	1	11/20/2019	Users Navigation

## Mock Properties

```
{
  "properties": [{
    "name": "Home",
    "address": "285 South Poverty Ave",
    "price": 15000,
    "rent" : 1000,
    "upgrade": 20000
  }, {
    "name": "Home",
    "address": "287 South Poverty Ave",
    "price": 15000,
    "rent" : 1000,
    "upgrade": 20000
  }, {
    "name": "Home",
    "address": "289 South Poverty Ave",
    "price": 15000,
    "rent" : 1000,
    "upgrade": 20000
  }, {
    "name": "Home",
    "address": "291 South Poverty Ave",
    "price": 15000,
    "rent" : 1000,
    "upgrade": 20000
  }
}
```

## Instructions

- Once landing on the main page of LogsCabin, you will be greeted with a login page. Here you will enter your username and password.
  - If you do not have an account, you can select Sign Up which will allow you to create an account
- After successfully logging in, you will see three options; New Game, Resume Game, and Join Game
  - New Game will lead you into a following screen where you will be the host and allow others to join.
  - Resume Game will put you into your current session where you may take your turn or see the board to plan your next move
  - Join Game will allow you to look for a new session where you will see the players in session and jump into the board game.
- To start the game, the players turns will be randomly selected and host will select a zip code where the board will populate with properties for sale in that location.
- As each player takes their turn, they are given the opportunity to purchase property on the tile they land on.
- If another player lands on another players property, they must pay the owner a small fortune.
- Player's mandatory task at the start of turn:
  - Pays loan to the bank if they have a loan, the player must pay 25% or 100% of their debt IF player has insufficient money then they sell a property to the bank for money. Player will lose if they have no property and insufficient money.
- Player's options after mandatory tasks:
  - Sell a property to bank.
  - Upgrade property , they can upgrade multiple of their owned properties only once. (4 lvls max)
- Player moves x tiles and lands on:
  - Unowned housing or commercial property :
    - Player decides to buy if has enough money.

OR

- Player decides to take a loan from the bank if they have no debt. (Player becomes the property owner and they get a debt)
- Owned housing or commercial property :
  - Player pays rent if has enough money OR else sells property to the bank for money.
- Player will lose if they have no property and insufficient money.
- Player is then able to ask the property owner if the property can be put for sale.
- Go to Misfortune:
  - Player is sent back to the Misfortune tile and loses money that randomly totals from 5% to 25% of the player's money.
- Fortune:
  - Player receives an amount of random money that totals from 5% to 25% of the player's money.
- Stock:
  - Player receives an amount of money that totals 5% of the player's money.