

OBJECT ORIENTED DESIGN

PROJECT PROPOSAL

Epic-Monopoly

SUSTech

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Abstract

In this project, we concentrate on developing a new monopoly game mechanics which is an online web game. We add economy factor in the game to make the game close to reality. The economy factor will change randomly in a period and influence the house price, station price and chance probability. In order to increase game enjoyment, we use dynamic map in the game. The map will change period to repick the fate of players falling behind. Besides country element, we also add new alliance element, for example, the tax and warfare depends on country's policy. The game difficult level depends on the fluctuation of the game parameter. We build enterprisers mid entering rules. The enterprisers allowed entered after the game began and when no one has more than 50% real estate, the initial money of enterprisers depends on the game turns.

Background

Mr. Wang, Mr. Li, Mr. Son and Mr. Trump, who are enterprisers from China, Japan and the US wants to play a game to decide who is the smartest in dealing business. They play Epic-Monopoly game with more variable and inexact parameter. Besides, enterprisers are allowed to join in mid. Of course, They choose hard mode. Mr. Wang choose buy more properties as soon as possible for larger probability that opponent step into him properties. Mr. Trump choose to buy expensive properties and build more rooms for luxury rental. Mr. Son invest steady. And Mr. Li choose as soon as buy the utilities. In mid, Mr. Ma join in. There are Large volatility under Hard difficulty, Mr. Trump spend is too much money to upgrade the properties leading to cash shortage, and then step into the opponent property. However, mortgage money cannot pay off the debt. Finally, Mr. Trump bankruptcy. Mr. Ma have many cash, and he auction into Mr. Trump's properties from the bank at a relatively low price. Mr. Ma take a place so quickly. Other enterprisers have a plan for them own benefit. So, they agree to form an alliance in order to protect mutual interest to suppress Mr. Ma. The game is getting more and more interesting.

Current Problems

The biggest problem of Monopoly game is that it is contradict to the real-life economy. The value of real estate is static which is impossible in reality. In the old time (Monopoly published in 1935), the game design cannot dynamic change the value of all the real estate in Monopoly. However, the development of web application, dynamic changes of the parameters of the game are available.

Second, there are not loyalty program in Monopoly. Rent of real estate stays still in regard of how many times a player paid for the rent. In reality, there are some reward for the renter for paying many times.

Also, the sequence of map cannot change in Monopoly, which must responsible for the loss of many players. If a player buys all the real estate for continues two color blocks, it will have much more chance to win this game. On the other words, the rest of players will lose the fate of winning the game.

Besides, because of lack of rewarding for cooperation, players seldom cooperate with each other. In Monopoly, players always play alone, complete with the rest of players. While on reality, enterprisers always cooperate with each other for the profit.

Solution & Silver Bullet

There are some solutions for the current problem, the rules may change during developing process. For the update information and detail, please see our web page: [EpicMonopoly Web Page](#)

a. Economy Factor

On the one hand, to be more reasonable to change the value of all real estate, card and value of other object. On the other hand, to increase the equality of all game parameters setting. Economy Factor (EF) is introduced to the Epic-Monopoly. For a specific period, EF will change between a certain range, and it will have influence on the rent, pricing of the house, etc.

b. Dynamic Map

The sequence of spot in the Epic-Monopoly will change in a specific period, to repick the fate of players who falling behind. In order to unified the map, the change of color blocks, stations and utilities will be control by some rules.

c. Country & Alliance

For the cooperation problem, countries and alliances are introduced to the Epic-Monopoly. Every player will assign to one countries and corresponding alliances. The trade and rent between the member of alliances will make discount. And some new event will add to opportunity, to add more fun. In reality, tax and warfare differ depends of country's policy. Therefore, the tax and some of cards in society chest will depends on which country the player belongs.

d. Difficulty Setting

Players can custom some game configuration, to simplified this process, difficult setting is introduced to the Epic-Monopoly. The difficulty most depends on the fluctuation of the game parameter. For example, easy model the EF setting will within 5% while normal model will be 10%.

e. Adding enterpriser during the game

Enterprisers are allowed to join the game after the game began. However, the enterprisers only able to join when unman real estate more than 50%. And the initial cash of the enterprisers is depended on how many turn the game have begun.

f. Loyalty Program

Instead of return cash or virtual currency, Epic-Monopoly will make discount for enterpriser. (The effect is same, but simpler) With the time enterpriser enter other's spot, the rent of the spot to this enterpriser will decrease. Same rules for prison. With the time an enterpriser bail from the prison, the price will increase, which is similar to reality.

UML Design

a. State Chart

Player will gather in a room, they can chose their character, color, country. The player who built the room is able to custom some setting, include difficulty, initial cash, etc. When all players are ready, the game begin. For the detail, please move to appendix I.

b. Class Diagrams

Basically, there are 5 classes: Role, Card, Room, Property, and Map. Class Role includes class User, class Bank. Class Card makes up the card pile of chance and destiny. Class Room keeps all information of a game. Property means all the blocks in the map. And Class Map keeps the information of sequence of the blocks and the global tax rate etc. For the detail, please move to appendix I.

User Interface Design

a. Chessboard

Our chessboard is designed based on the one in classical version. The layout is the same. But icons and color schemes are our unique style. For the detail, please move to appendix II.

b. Welcome Page

Players will firstly come to the welcome page. Here they can set nickname and avatar and then start a game. For the detail, please move to appendix II.

c. In-game Main Interface

During game, the chessboard as well as two dices and “Roll Dice” button (alternately available among players) will be laid in the center, with players’ locations and buildings and ownerships of spaces showed in a simple and clear way. Room number, players’ information and conditions, volume controllers are on the left. Record for all events and dynamic arguments are displayed on the right side. For the detail, please move to appendix II.

d. In-game Check & Management Interface

When click any space on the chessboard, check & manage interface will come out on the right. It includes information of that space and buttons to operate it. For the detail, please move to appendix II.

e. In-game Trading Interface

When click any other player on the left, trading interface will come out on the right. And check boxes will appear near all the optional spaces. For the detail, please move to appendix II.

Functional Requirement

This project will be proceeded from three stages. First stage is architecture design, it should be due on the end of Oct, includes the UML design, mockup design, hardware and software configurations. Second stage is coding developments, which includes implementation of all the functions that UML represents, and it should be due on middle of Nov. or later few days than that. The last stage test stage, we will test this project from unit test, integration test, system test, acceptance test. This project should be finished before the day it dues and the deadline before the SCORE-2018.

Design Document

Architecture: Client, Server, UI

Framework: Tornado

Technologies: Json, Database, JavaScript, Websocket

Game engine: Phaser

Project website and Github:

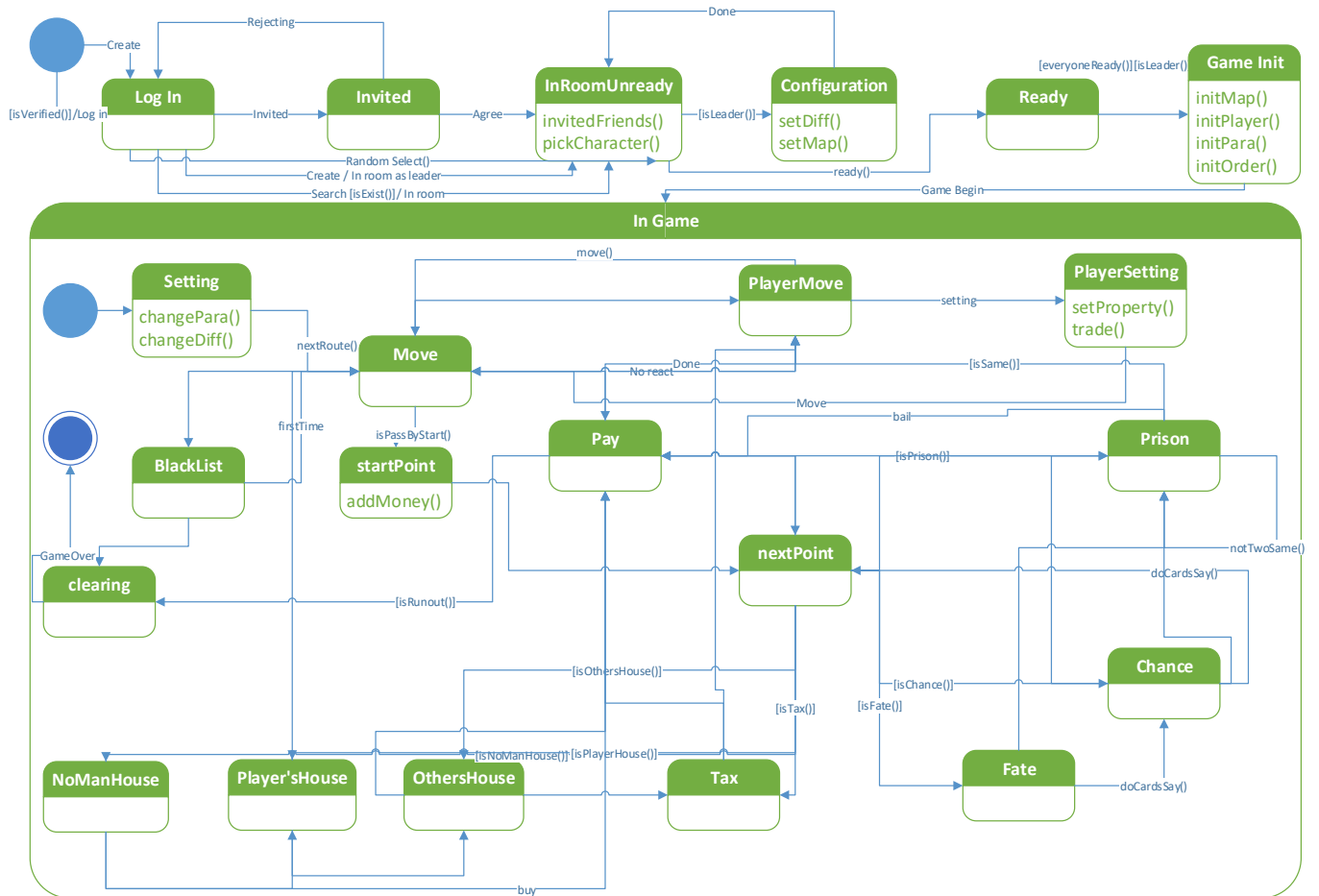
[EpicMonopoly Web Page](#)

Github: <https://github.com/EpicMonopoly>

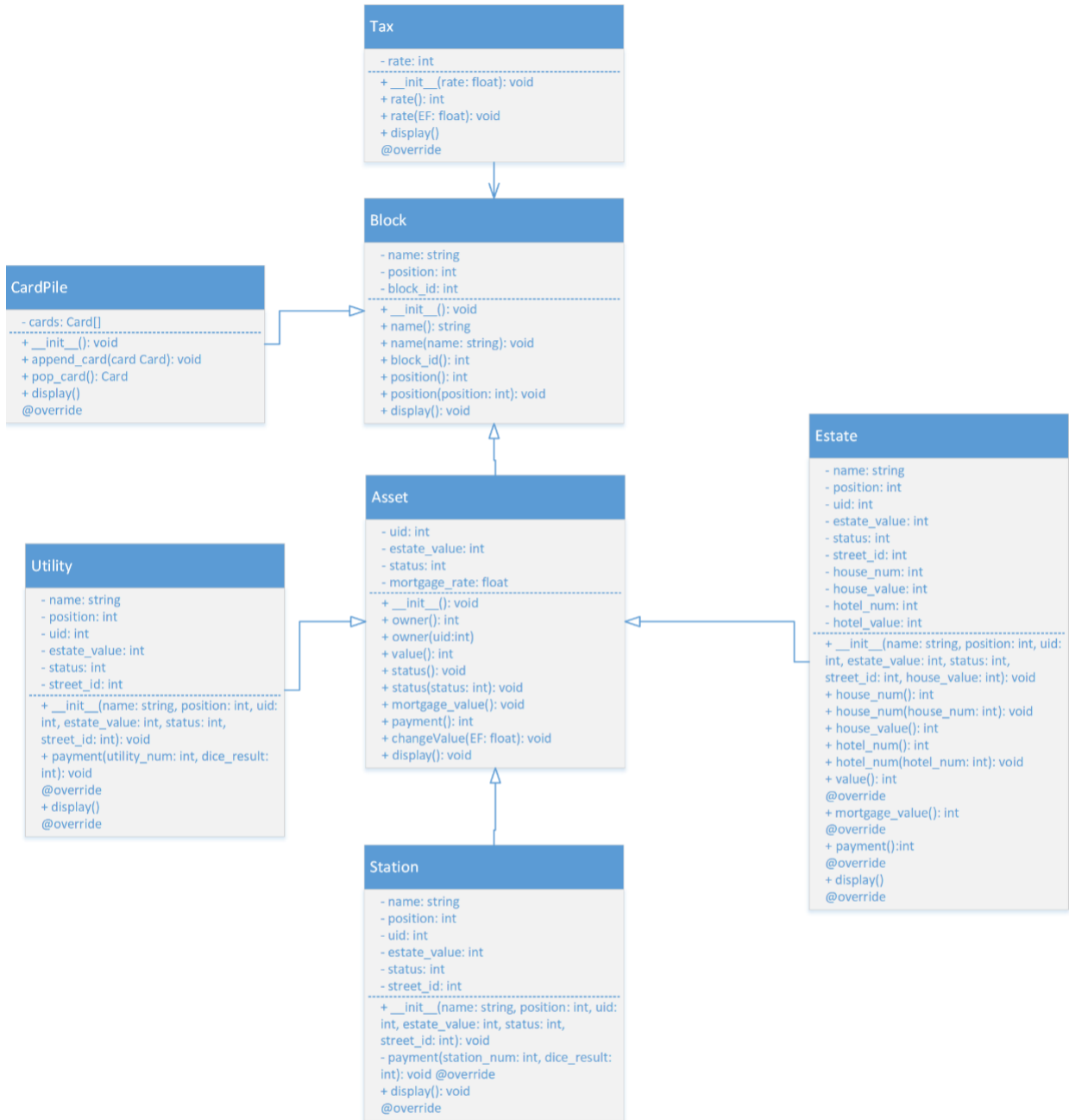
PS: source code will be public when contest is finished and all the commits are tractable.

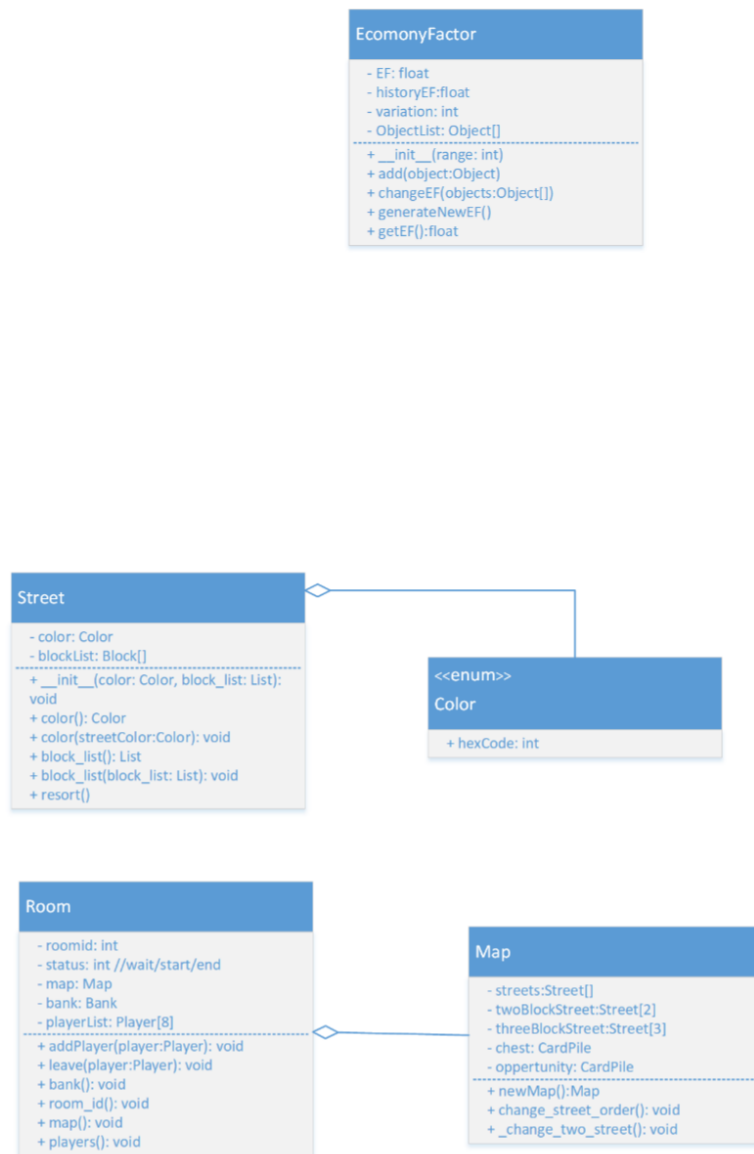
Appendix I - UML

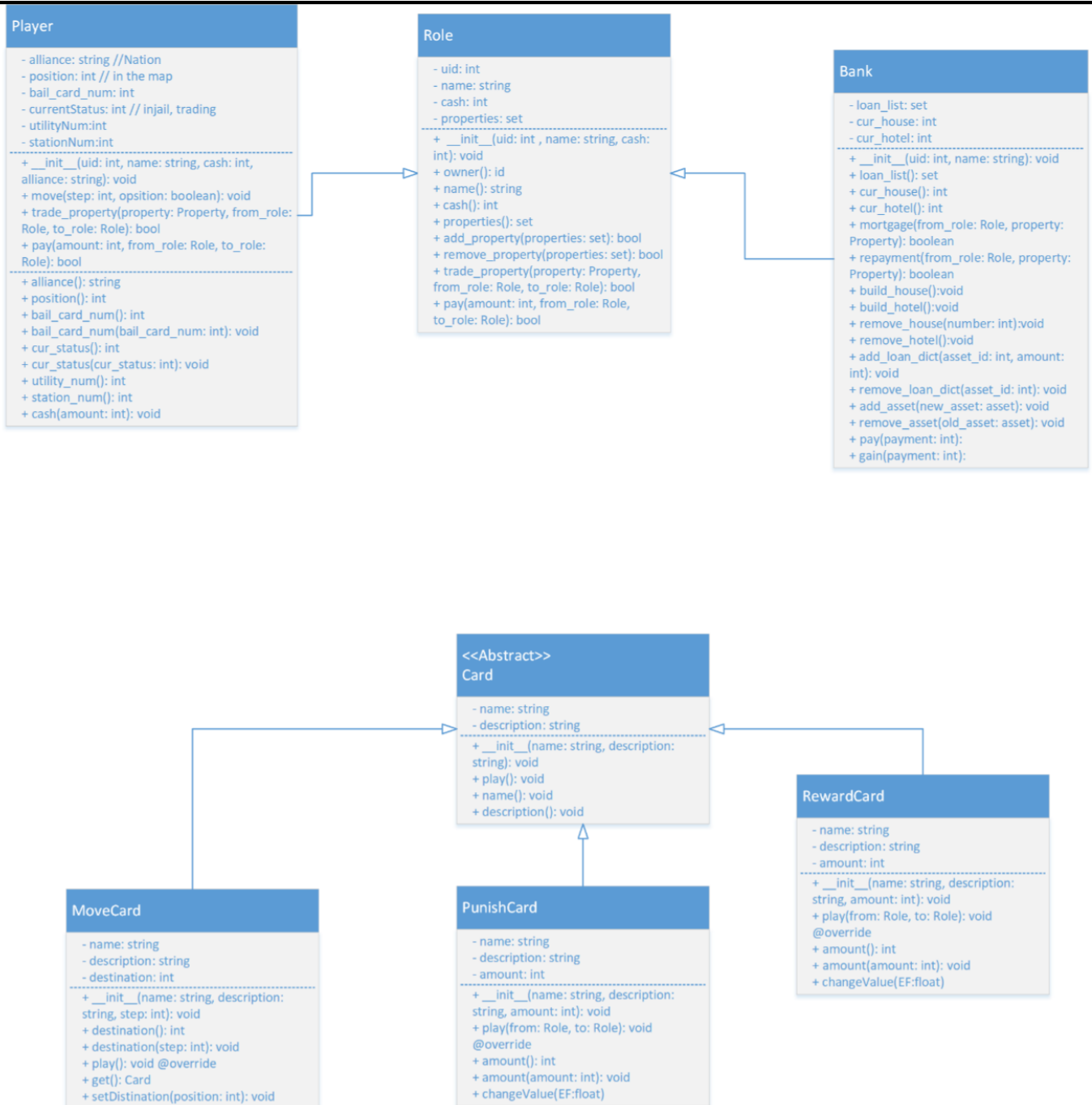
State Chart



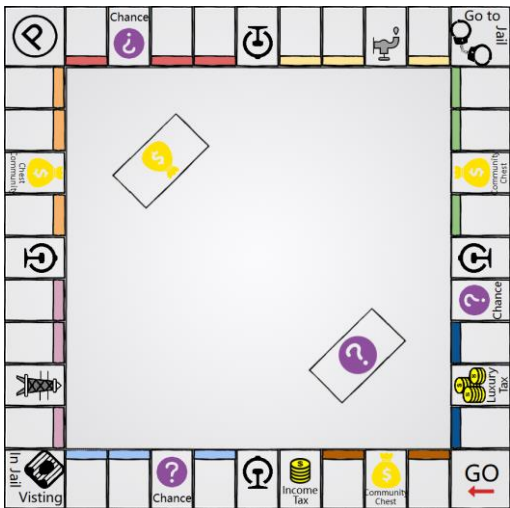
Class Diagram







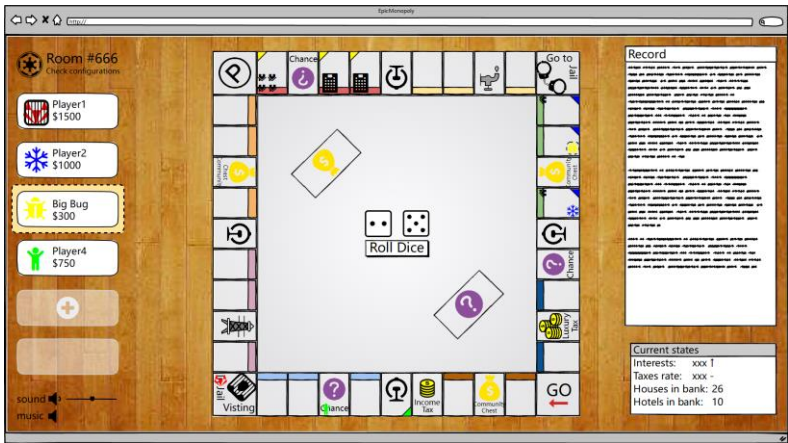
Chessboard



Welcome Page



In-game Main Interface



In-game Check & Management Interface



In-game Trading Interface

