Code Gladiators

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The game takes inspiration from CS Unplugged in designing a way to teach grade school, high school and adults from non-CS background of computational thinking. We designed an interactive multi-player game in Greenfoot to mirror Binary Search Algorithm, and thereby teaching individuals of the use of search algorithms in everyday life and how they can improve search efficiency.
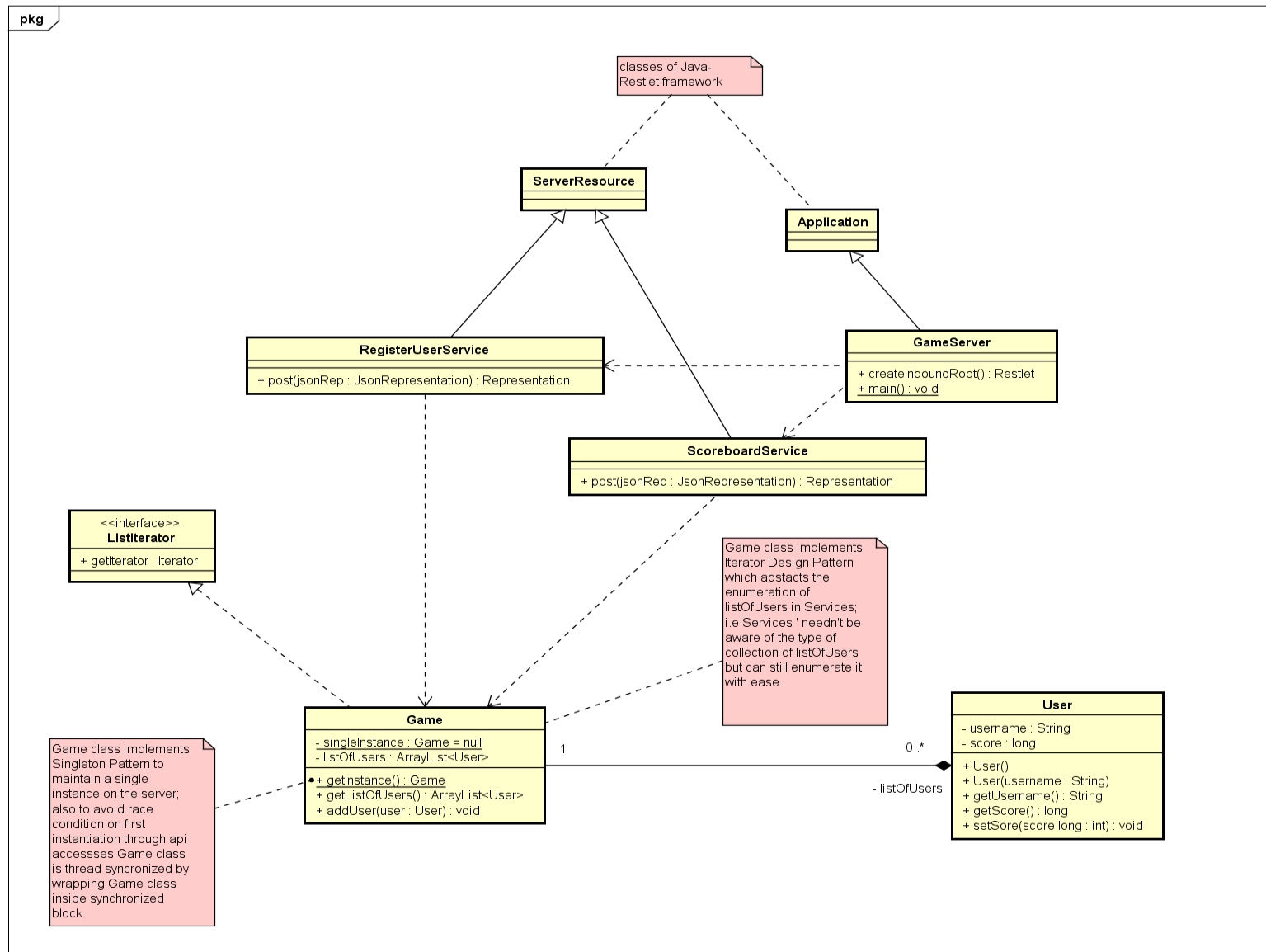
Game Story

- The story we are talking about is a thief looting money from all the houses in a City - the player's task is to catch the thief in an optimal way by visiting the minimum number of houses using the binary search technique.

- Learning and applying binary search algorithm throughout the game will fetch maximum points to the player.
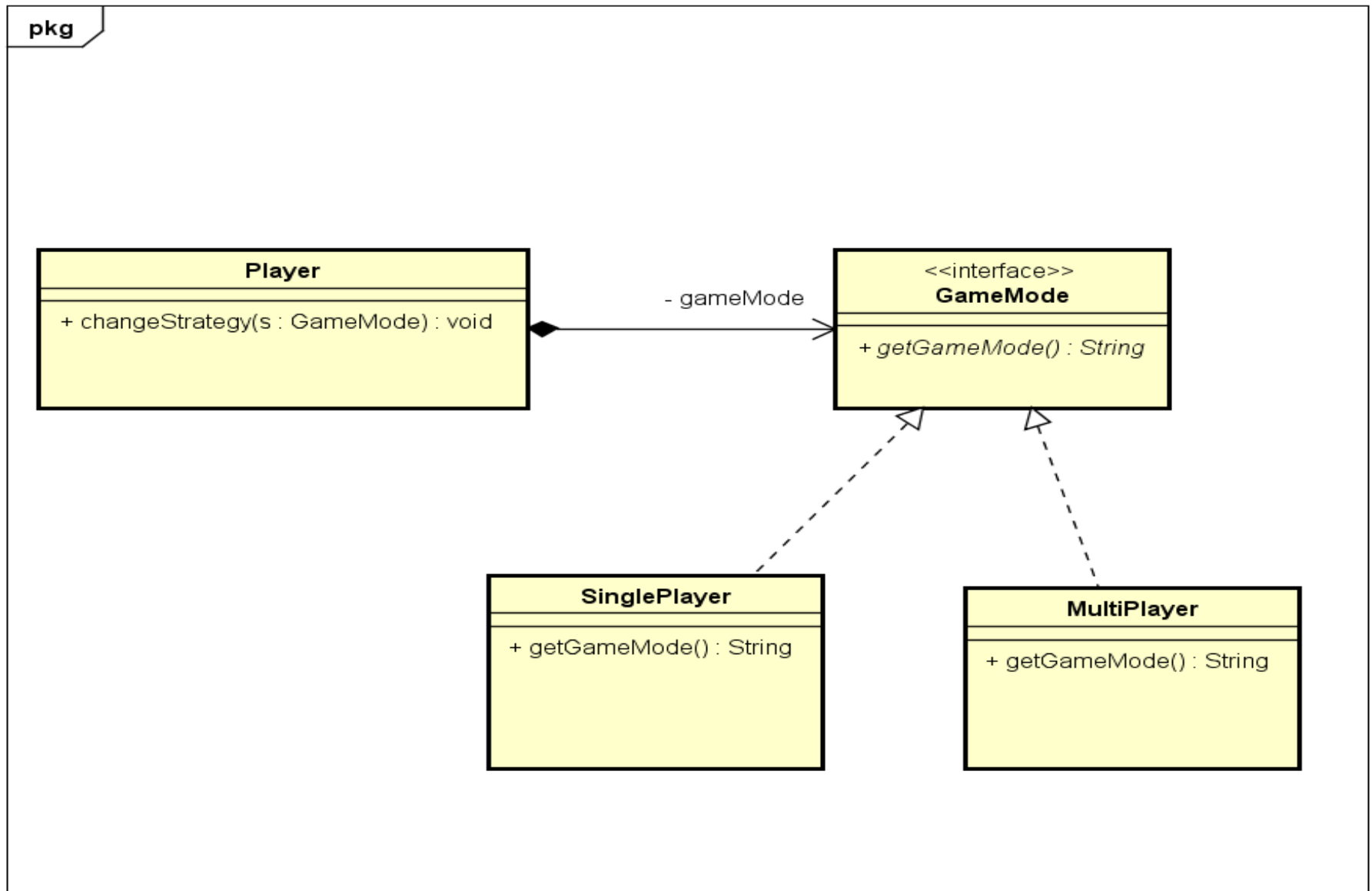
Design patterns

- We have used the following design patterns in our game implementation

❖Strategy Pattern

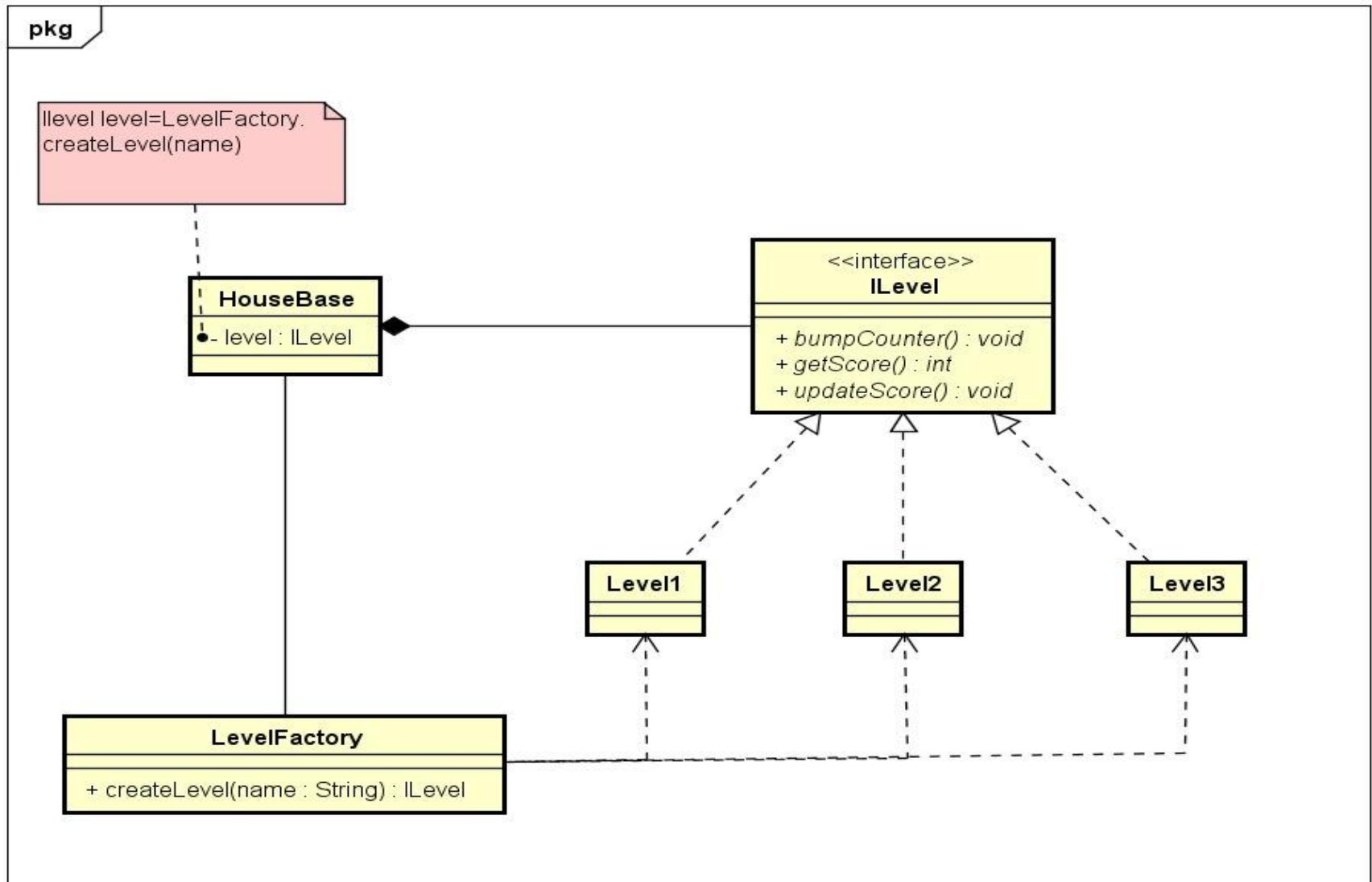❖Iterator Pattern

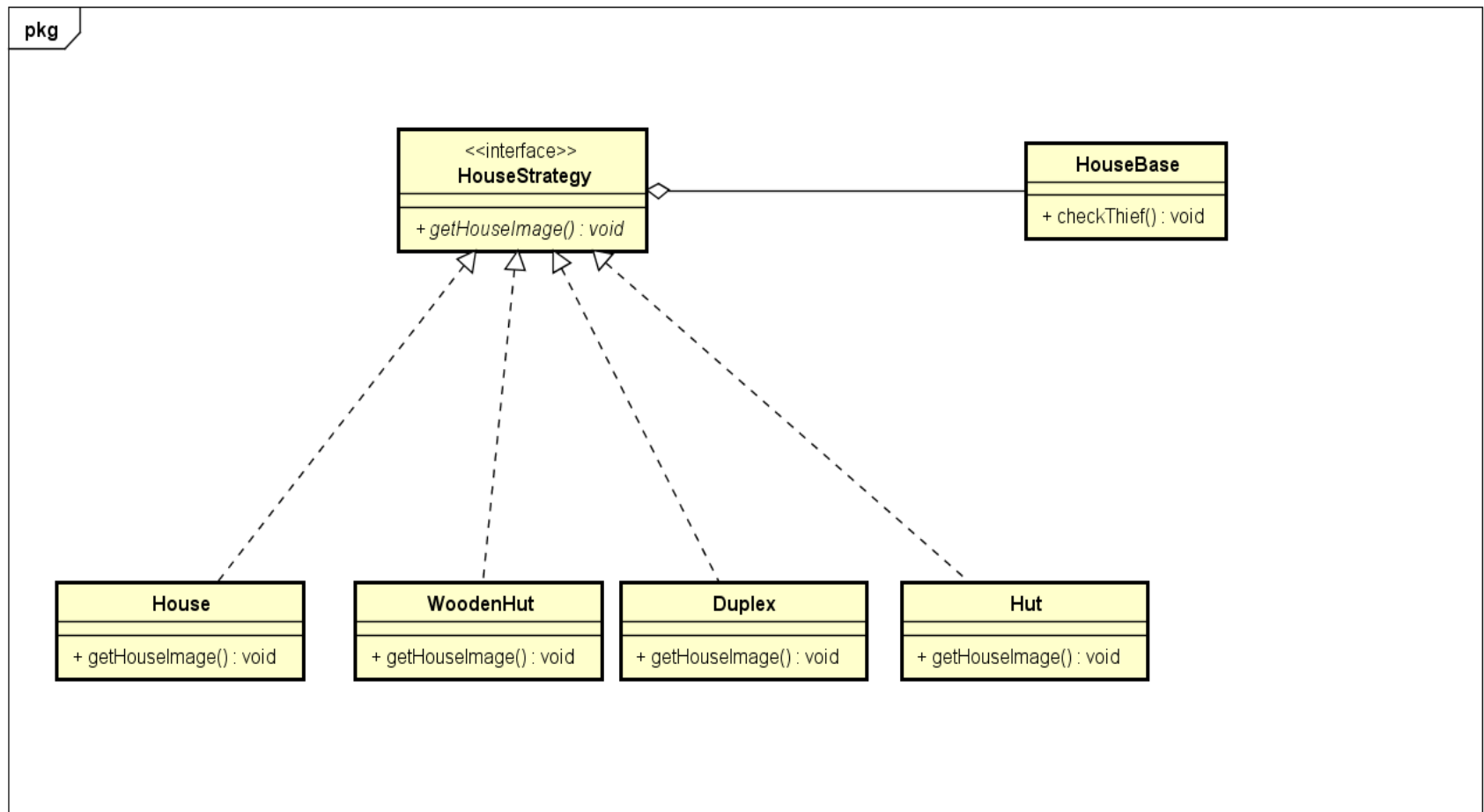❖Factory Method Pattern

❖Singleton Pattern

Iterator Pattern

pkg

classes of Java-Restlet framework

ServerResource

Application

RegisterUserService

+ post(jsonRep : JsonRepresentation) : Representation

GameServer

+ createInboundRoot() : Restlet
+ main() : void

ScoreboardService

+ post(jsonRep : JsonRepresentation) : Representation

<<interface>>
ListIterator

+ getIterator : Iterator

Game class implements Iterator Design Pattern which abstacts the enumeration of listOfUsers in Services; i.e Services ' needn't be aware of the type of collection of listOfUsers but can still enumerate it with ease.

Game

- singleInstance : Game = null
- listOfUsers : ArrayList<User>

+ getInstance() : Game
+ getListOfUsers() : ArrayList<User>
+ addUser(user : User) : void

Game class implements Singleton Pattern to maintain a single instance on the server; also to avoid race condition on first instantiation through api accessses Game class is thread syncronized by wrapping Game class inside synchronized block.

User

- username : String
- score : long

+ User()
+ User(username : String)
+ getUsername() : String
+ getScore() : long
+ setSore(score long : int) : void
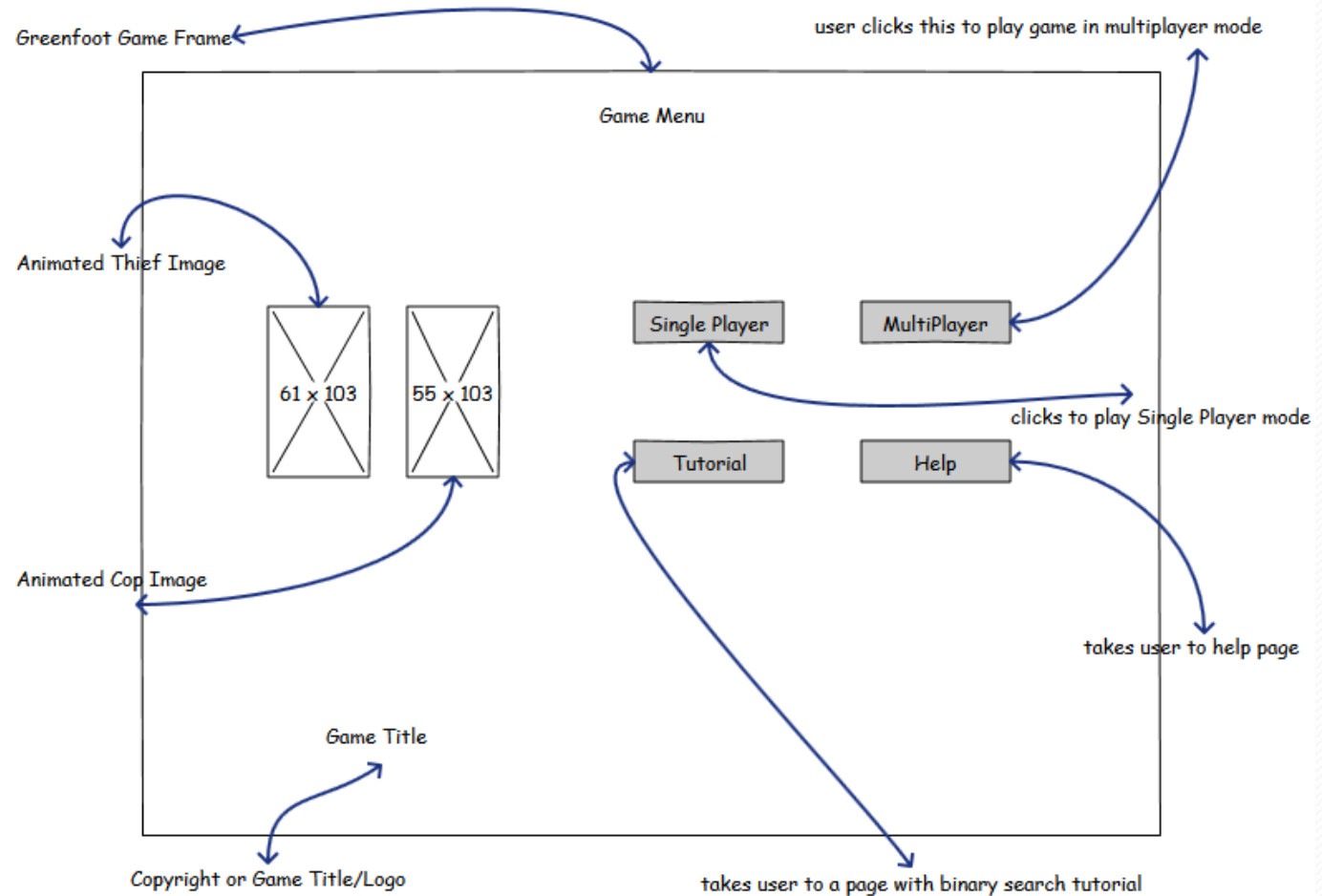
1   0..*
- listOfUsers

Strategy Pattern

Factory Method Pattern

Strategy pattern

UI Wireframes

Greenfoot Game Frame

Game Menu

user clicks this to play game in multiplayer mode

Animated Thief Image

61 x 103   55 x 103

Single Player   MultiPlayer

clicks to play Single Player mode

Tutorial   Help

Animated Cop Image

takes user to help page

Game Title

Copyright or Game Title/Logo

takes user to a page with binary search tutorial

UI Wireframes

Gamefoot Game frame

Notifies the user of the maximum no.of moves available

Game World

Houses are arranged in ascending order of their wealth

counter

wealth

wealth

wealth

wealth

wealth

Theif(house property)

wealth

wealth label indicates user of the money each house has

wealth

theif will be stealing from one house at one time,
also thief steals in order of priority->more wealth to lower

player messages/game notifications

Player (Actor: `Cop`)

UI Wireframes

Greenfoot Game frame

Image for better UI/UX

Help

100 x 100

Place holder text for describing the game rules and instrcutions

Line 1

Line 2

Line 3

Line 4

Line 5

Line 6

100 x 100

Back

Image of control buttons

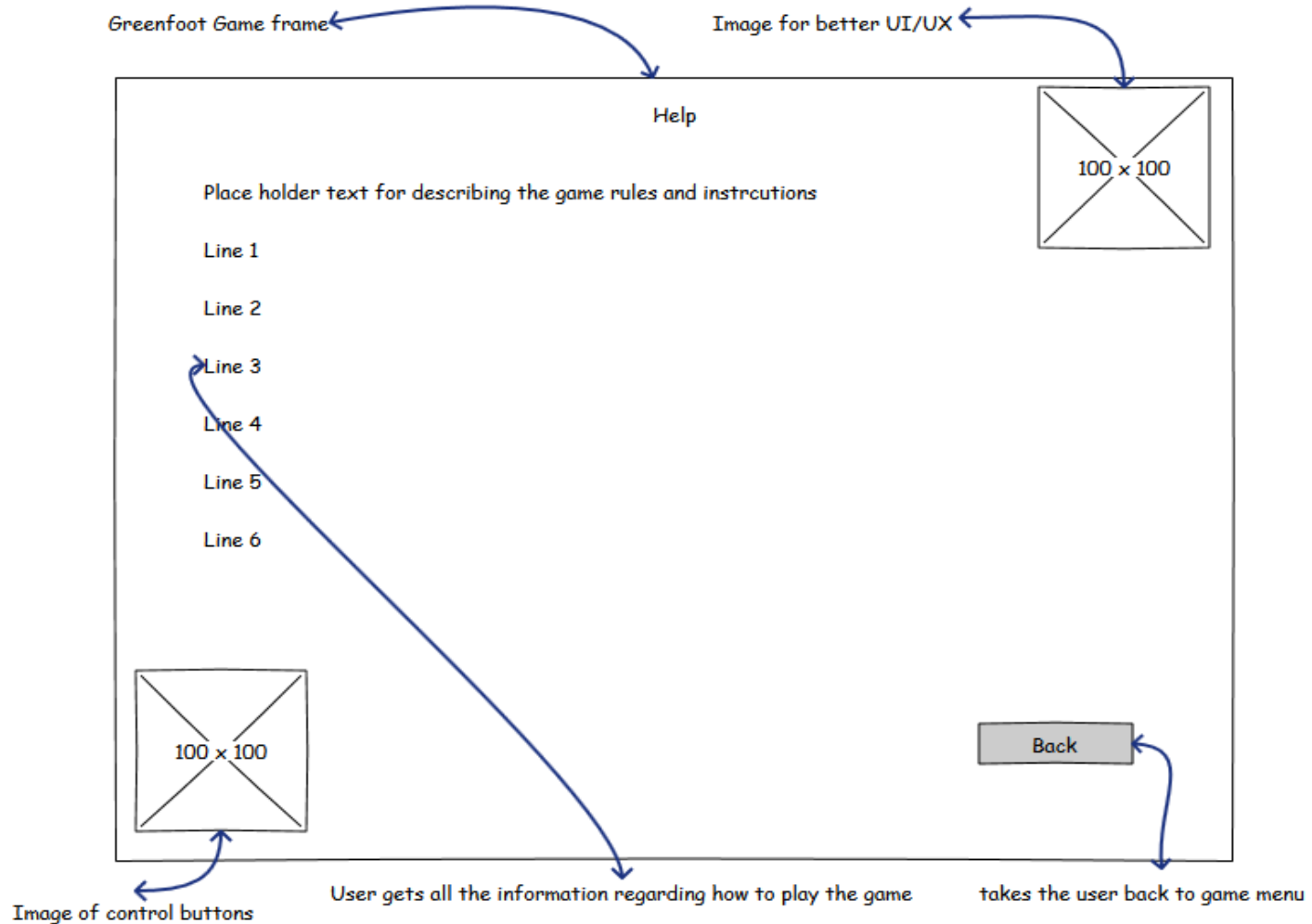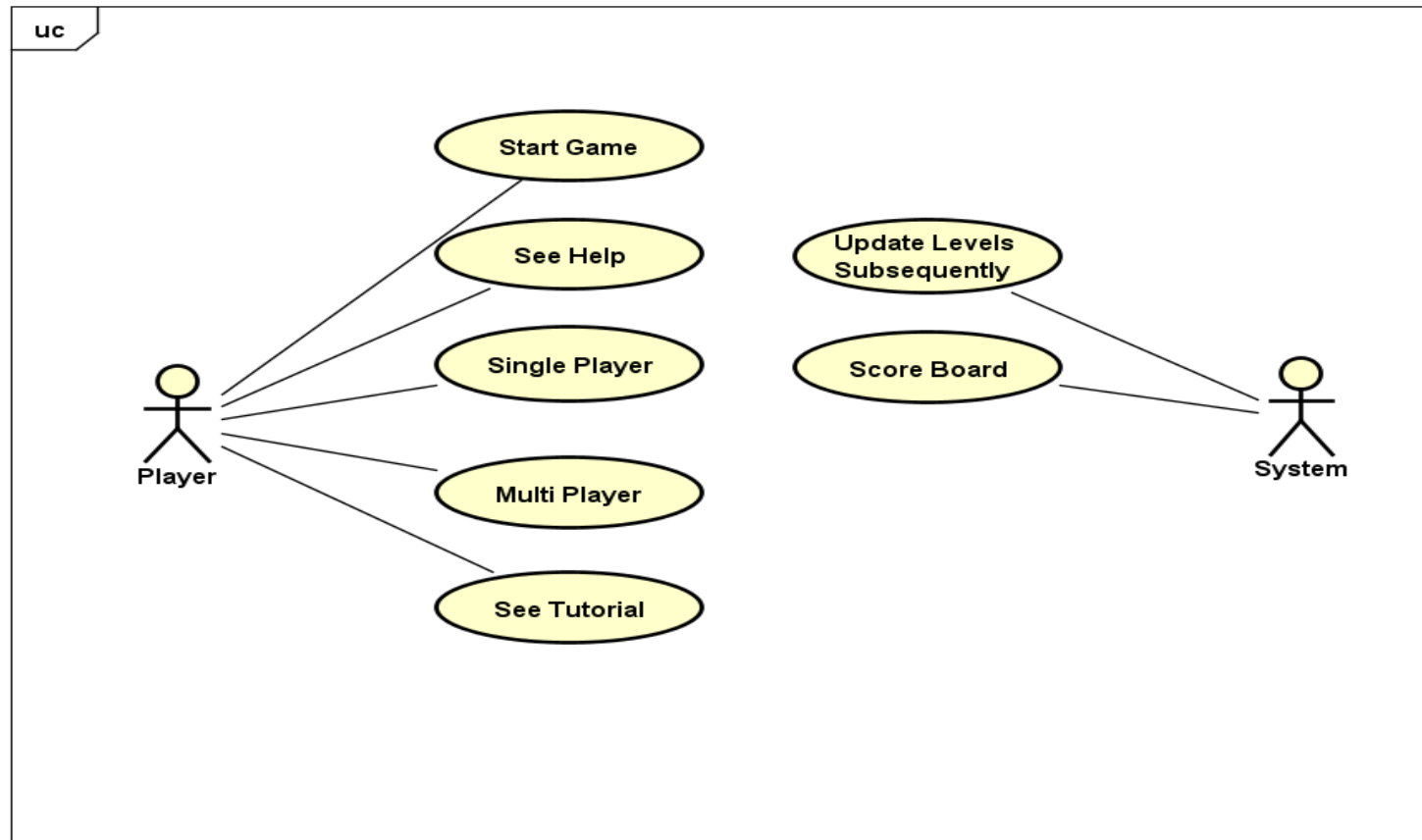User gets all the information regarding how to play the game
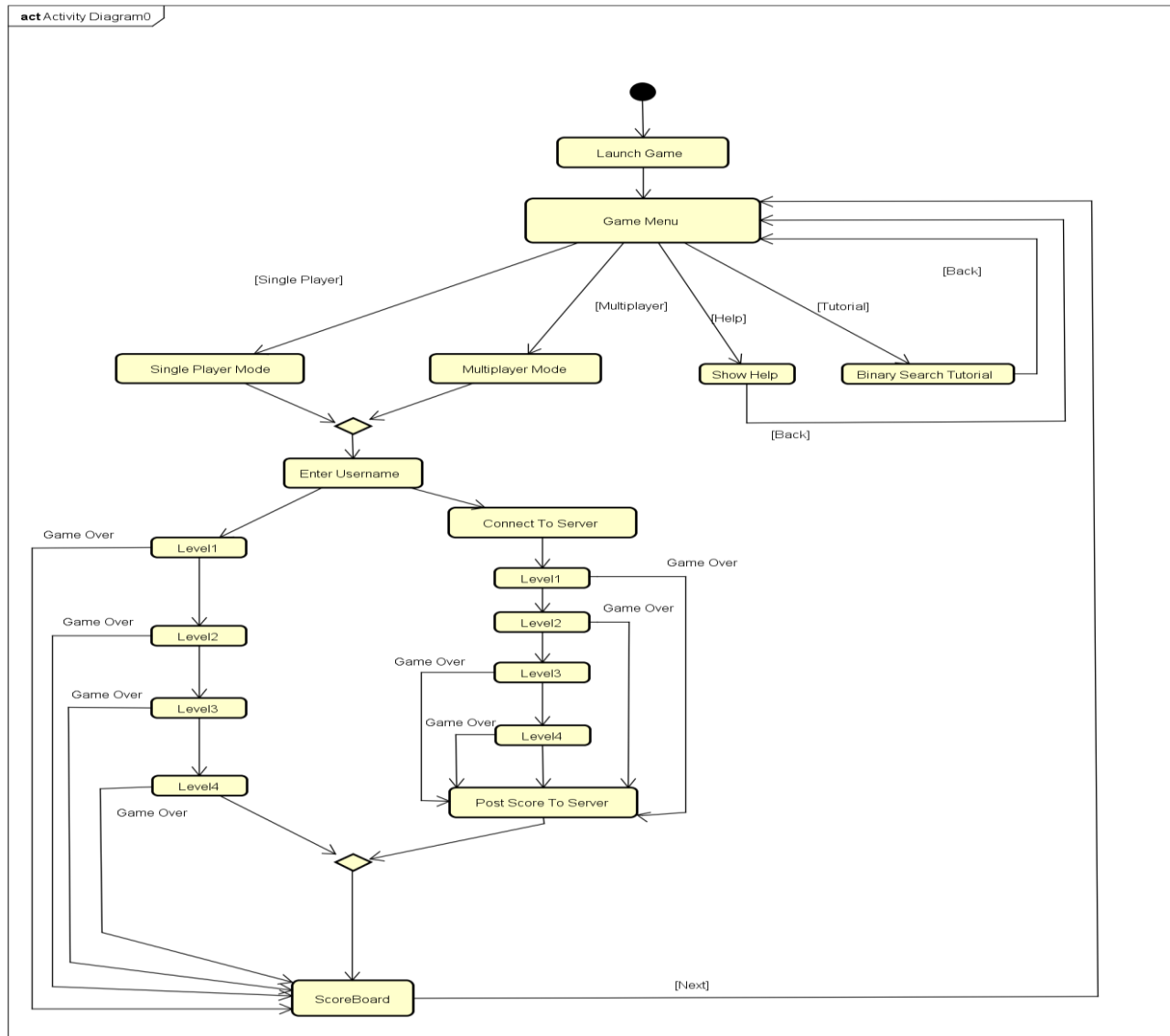
takes the user back to game menu

Use Case

Activity Diagram

Special Features

- Single and Multi Player Modes.
- Excellent Tutorial for Binary Search.
- Difficulty of the game increases in each level.

Coming Soon..

➢ More Levels.

➢ Enhanced User Interface design of the Game as the Level Increases.

➢ Increased Difficulty levels of the game with added objects.

From then on, I dreamed in pixels.

THANK YOU