**Software Design  
Document**

for

Project 1 – Chess Game

Version 1.0 approved

Prepared by Madison Kuyawa, William Widmer, Bunrith Seng, Robert (James) Castleberry, Scott Flolid

CS3398

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# Introduction

## Purpose

To design and implement a game of chess that a user can play and use against another player or against an AI.

## System Overview

Our system will be implemented in java using javafx and fxml to build our Graphical User Interface(GUI). Our system will use a controller class to handle all user actions with in the GUI and to implement certain functionalities that we create in scene builder. Our system will also make use of other classes including classes for the pieces and game board.

## Definitions, Acronyms and Abbreviations

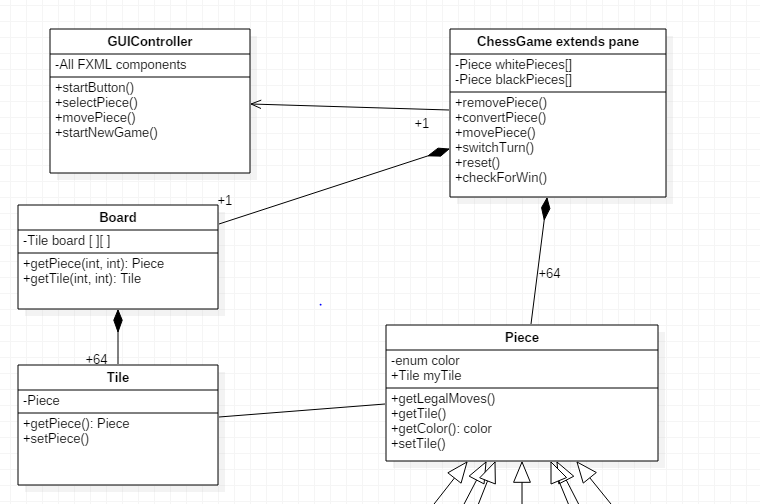
GUI – Graphical User Interface

PvP – Player vs. player

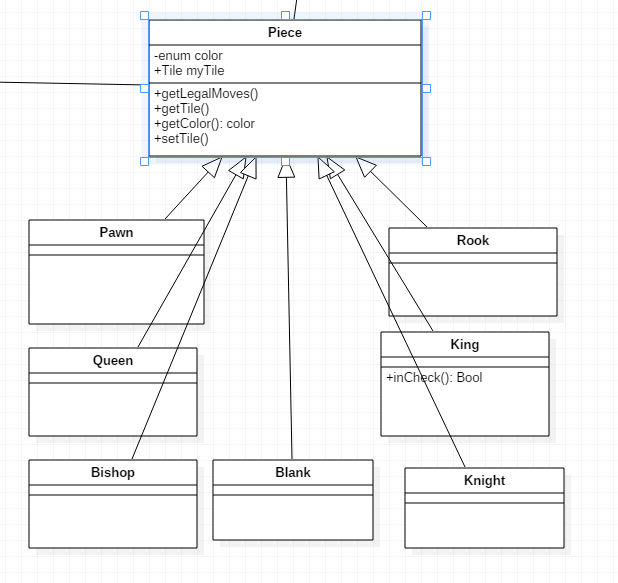
PvAI – Player vs artificial intelligence.

# Architecture

Below is a high-level class diagram describing the internal structure of the system:



Additional view of the Piece class from the class diagram:



# Overview

The classes we will use in our Chess Game are GUIController, ChessGame, Board, Tile, Piece, Pawn, Queen, Bishop, Rook, King, Knight, and Blank.

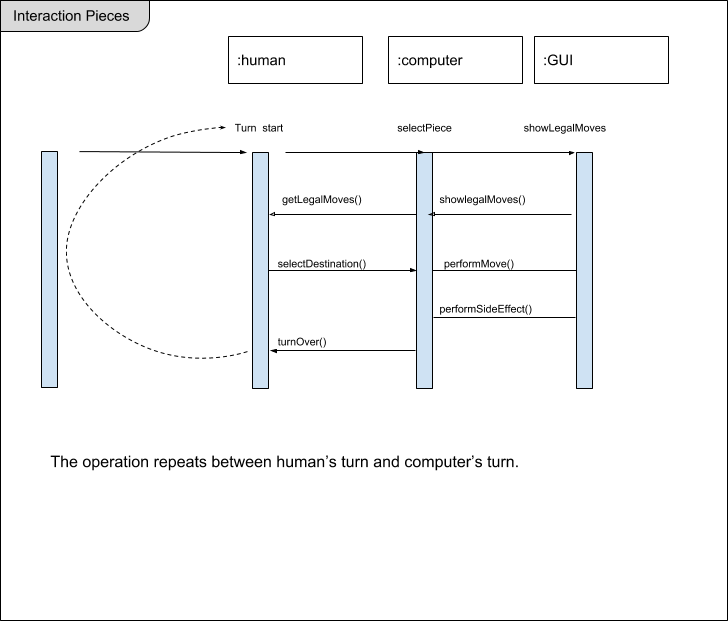
# Components

1. GUIController Class: A basic GUI that contains all FXML components.
2. ChessGame Class: This class extends Pane and contains all basic functionality for the Chess Game to work.
3. Board Class: Has a composition relationship with the ChessGame Class, meaning ChessGame “has a” Board.
4. Tile Class: Has a composition relationship with the Board Class, meaning Board “has a” Tile. The Tile Class uses a Piece object.
5. Piece Class: Has a composition relationship with the ChessGame Class, meaning ChessGame “has a” Piece.
6. Pawn, Queen, Bishop, Rook, King, Knight Classes: These are the individual piece classes and different types of pieces that will be present on the chess board.
7. Blank Class: This is considered a type of piece. Our chess board will have every single tile filled; if not filled with one of the 6 types of pieces, then the tile will be filled with this “Blank” piece.

# High-Level Design

This section contains more specific diagrams, each of which support the architecture of our Class Diagram seen in Section 2 above.

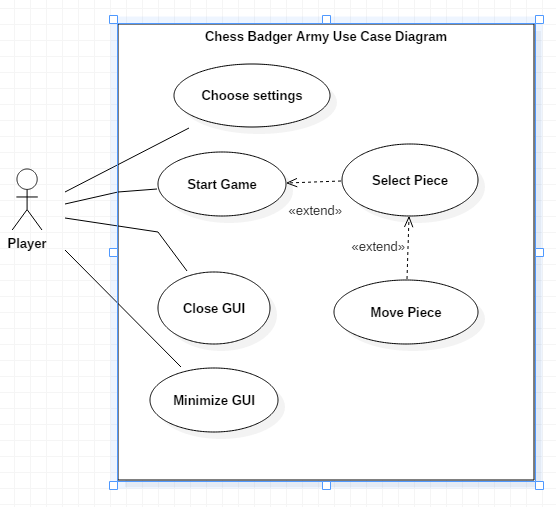
## Sequence Diagram for Pieces



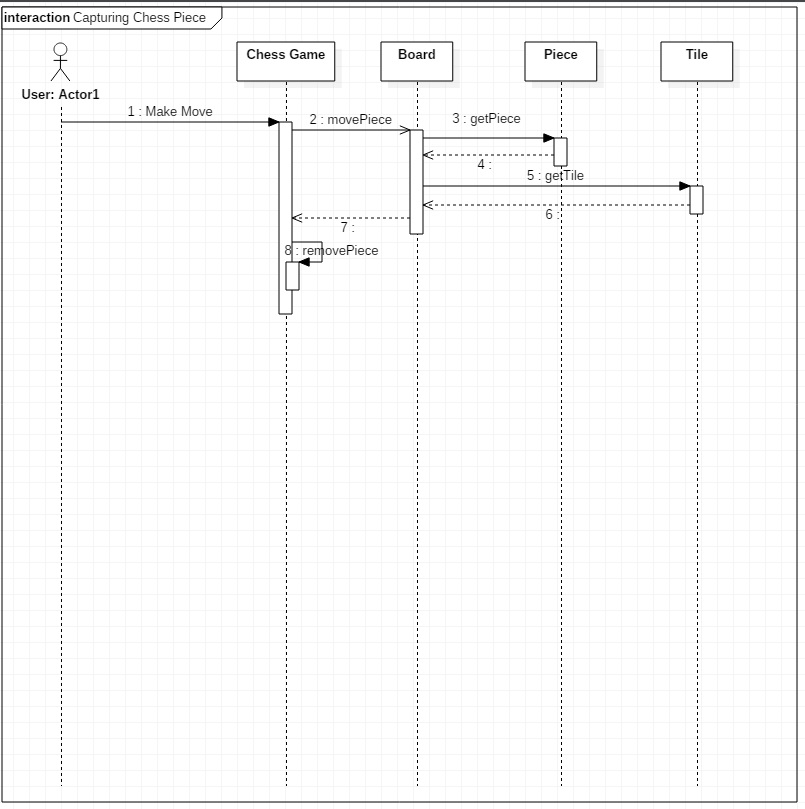
## Use Case Diagram

This Use Case Diagram goes over the various interactions that a player will be able to make with the

System.

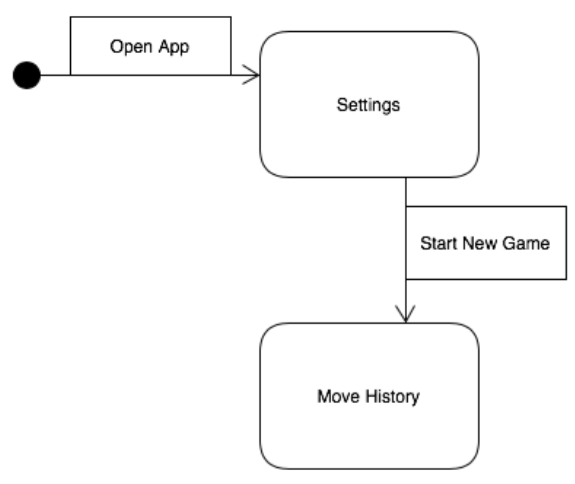


## Sequence Diagram for When a Piece is Captured

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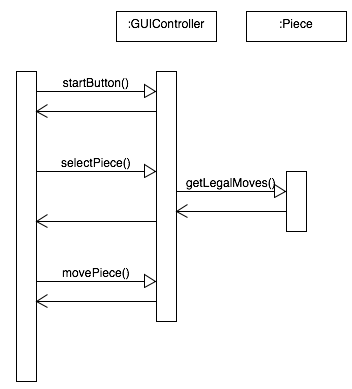
## State Machine for the Settings/Move History Panel

The following state machine diagram displays the state of the side panel. There are two states that the Settings/Move History panel may have: ‘Settings’ or ‘Move History’.



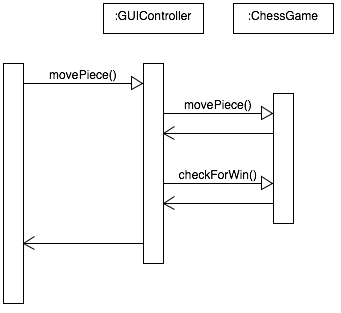
## Sequence Diagram for Start Button

The below diagram shows the sequences for starting a new game.



## Sequence Diagram for Ending a Game

The below diagram shows the sequences for ending a game.

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