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| HANOI UNIVERSITY OF SCIENCE AND TECHNOLOGY  SCHOOL OF INFORMATION AND COMMUNICATION TECHNOLOGY  DEPARTMENT OF SOFTWARE ENGINEERING  -----\*-----  hutlogobig.jpg |
| PROJECT REPORT |
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Table of Contents

[1. Assignment of Members 3](#_Toc73008479)

[1.1. Detail for classed/method 3](#_Toc73008480)

[1.2. Idea/Souce Code 5](#_Toc73008481)

[2. Mini-Project Description 5](#_Toc73008482)

[2.1. Details project requirement 5](#_Toc73008483)

[2.2. Use case diagram and Explanation 6](#_Toc73008484)

[3. Design 7](#_Toc73008485)

[3.1. General Class Diagram 7](#_Toc73008486)

[3.2. Serveral Class Diagram 8](#_Toc73008487)

[3.3. Explanation of Design 9](#_Toc73008488)

# 1. Assignment of Members

## 1.1. Detail for classed/method

* + 1. Package Constant: Save constant attribute of game.
* frameWidth, frameHeight: Size of frame.
* houseSize: Size of house.
* START\_X, START\_Y: Start position of X, Y.
* GAME\_FPS: Frames per second.
* STARTING, VISUALIZING, INTRODUCE, GAME\_CONTENT\_LOADING, MAIN\_MENU, CHOOSE\_MODE, OPTIONS, RULES, PLAYING, GAMEOVER, DESTROYED, PAUSE, SUMMARY: Possible states of the game.
  + 1. Package Calculate:
* Class BossSave: to save state of bossHouse.
* Class PlayerSave: to save score of players.
  + 1. Package GameComponent:
* Class BossHouse: Draw the Boss House and some properties of BossHouse.
* Class ChessHouse: Draw the Chess House and some properties of ChessHouse.
* Both of it inherit the Abstract Class House: HouseID, NumberStone, Population, Shape,…
  + 1. Package Static: Include images and sound of the game.
* Class ImageGame: Load all images of the game.
* Class Sound: Load sound for the game.
  + 1. Class Animation: for creating animation
* Int x, y: coordinates
* Boolean active: State of animation to check if it finished.
* Method changeCoordinates(): Change the coordinates of the animation.
* Method Update(): Check when to show next frame of animation or if animation is finished.
* Method Draw(): Draw current frame of the animation.
  + 1. Class Board:
* Int x, y: Position of board.
* chessHouse: 10 chessHouse from 1->5 and 7->11.
* bossHouse: 2 bossHouse(0,6)
* Method initBoard(): Create and set initial coordinate for Board.
* Method draw(): Draw the house of chess and boss.
  + 1. Class Controller:
* Game game, Player player, Board board: Game component.
* stoneInHand, x\_hand, y\_hand: Image hand.
* Int action\_eat: Eat stone.
* Int action\_pick: Get stone from board. If action\_pick = 1=> pick\_stone, if = 2 => put hand down.
* Boolean action\_drop: Drop stone.
* Method handleGame(): Execute step.
* Method handleCalculate(): Execute step and eat.
* Method setBoardByGameState(): Set Board by game state.
* Method setPlayerByGameState(): Set Player by game state.
* Method addMoreStone(): Add more Stone in Calculate function.
* Method addStone(): Add one stone to each house of next turn player when drop.
* Method getStone(): Get all stone of this house and set number of stone to 0.
* Method moveNextHouse(): Move the next house in player turn.
* Method getNextHouse(): Get the next house id.
* Method drop\_oneStone(): Drop stine in hand. If number of stone in hand is 0 => change the state to CHECK.
* Method dropStone(): get Stone and drop to the board until number of stone in hand is 0.
* Method checkFinalHouse(): Check if cannot pick the stone.
* Method checkEmpty(): Check if house is empty or not.
* Method eatStone(Boss): Eat Stone(Boss).
* Method calculateScore(): Calculate the Score when game finish.
* Method isPlayer1(): Check if the turn is player 1 or not.
* Method nextTurnIsPlayer1(): Next turn player 1.
* Method setTurnToken(): Set token for next turn.
* Method checkBoardPlayer(): Check if all house is empty to add stone.
* Method setCoordinateGetStone(): Set coordinate of hand to get stone.
* Method increaseCoordinate(): Increasing the coordinate.
  + 1. Class Frame:
* Method Draw(): Drawing the screen.
* Method keyboardKeyState(): Check if the keyboard button is pressed. Return True if pressed, else false.
* Override some KeyListener method.
* Method mouseButtonState(): Check if mouse button 1 and 2 are pressed or not.
* Override sone MouseListener method.
  + 1. Class Game:
* BufferedImage (NameAttribute): Image for game.
* Method Initialize(): set Variables and objects for the game.
* Method RestartGame(): Restart game – reset some variables.
* Method UpdateGame(): update game logic.
* Method Draw(): Draw the game to screen.
* Method animation\_1(), animation\_2(): create animation for the game.
* Method LoadContent(): Load all the game’s component (images, sounds,…).
  + 1. Class GameHistory: This class is use for the “Return” option when each player want play again their turn.
    2. Class GameState: to save some important attribute.
* Method GameState(): Save step, boss, house, turn, player, stone,…
  + 1. Class GUI: File to Run the Game.
    2. Class MainGame:
* player1ScoreCount, player2ScoreCount, player1Score, player2Score, choose\_bot: Score of each Player.
* gameOverCount: State of GameOver.
* BufferedImage (NameAttribute): Image of each game’s component.
* gameTime, lastTime: Time of the game.
* gameStateMenu, preState: Current State of Game
* Method Initiallize(): Set the variables and objects for this class, variables and objects for actual game can be set in Game.java.
* Method LoadContent(): Load file for this class, file for game will be set in Game.java.
* Method GameLoop(): Update the Game in specific intervals of time.
* Method gameMenu(): Display Game Menu.
* Method gameRule(): Rules of game.
* Method newGame(): Start new game.
* Method restartGame(): Restart game and reset some variables.
* Method Draw(): Draw the game to Screen.
* Method mousePosition(): return position of the mouse pointer in game frame/window.
* Method keyReleasedGameWindow: Call when keyboard key is released. Eg: Esc: exit,…
* Method mouseClicked: Call when mouse button is clicked.
  + 1. Class Player:
* Method initPlayer(): set up Variables.
* Method setSize(): Set player side.
* Method turn(): Make all sequence of action when player choose house.
* Method auto(): Auto play if overtime.
* Method giveTurnToken(): Give turn for the Controller.
* Method giveTokenRollBack(): Set Token for history.
* Method getStep(): Return Step.

## 1.2. Idea/Source Code

# 2. Mini-Project Description

## 2.1. Details project requirement

+ On the main screen:

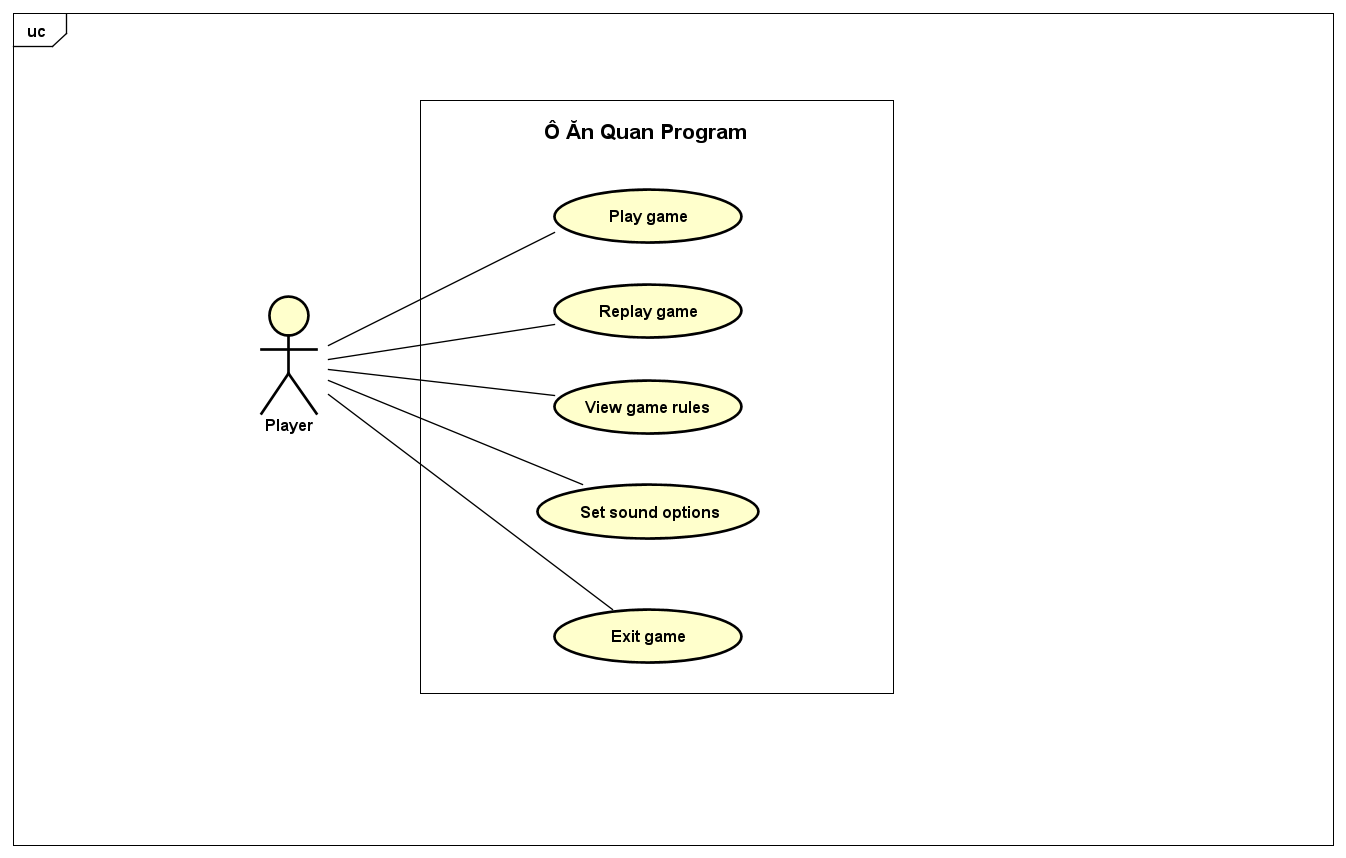
* Start: start the game. For convenient, you do not have to create different difficulties
* Exit: exit the program. Be sure to ask users if theyreally want to quit the game
* Help: Show guide for playing the game

+ In the game:

* Gameboard: The gameboard consists of 10 squares, divided into 2 rows, and 2 half-circle on the 2 ends of the board. Initially, each square has 5 small gems, and each half-circle has 1 big gem. Each small gem equals 1 point, and each big gem equals 5 points.
* For each turn, the application must show clearly whose turn it is. A player will select asquare and a direction to spread the gems. He got points when after finishing spreading, there is one empty square followed by a square with gems. The score the gotfor thatturn is equal to the number of gems in that followed square (see the gameplay for moredetails about streaks)
* The game ends when there is no gem in both half-circles. The application must notify who is the winner and the score of each player.

## 2.2. Use case diagram and Explanation

2.1.1. Use case diagram



2.2.2. Explanation

* Users can play game
* They can replay game after a game ended.
* They can view game rules while they are playing game by clicking on ***HELP*** button on the pause panel or main screen.
* Additionally, users can turn on or tun off game sound by clicking on ***OPTIONS*** button on the main screen.
* Finally, they can exit game by clicking on ***EXIT*** button on the main screen or ***X*** button on the right corner of the game window.

# 3. Design

## 3.1. General Class Diagram

Diagram

Description automatically generated

## 3.2. Several Class Diagram

## 3.3. Explanation of Design