

TuaThaiKraiGorDai

Introduction

In this game, you are playing as a knight and a cowgirl whose duty is to save the world from the monsters. One day you found out that there were the monsters which came from the other planet and planned to take over the world, so you have to kill and stop them from whatever they're going to do.

Game Control

Start Window

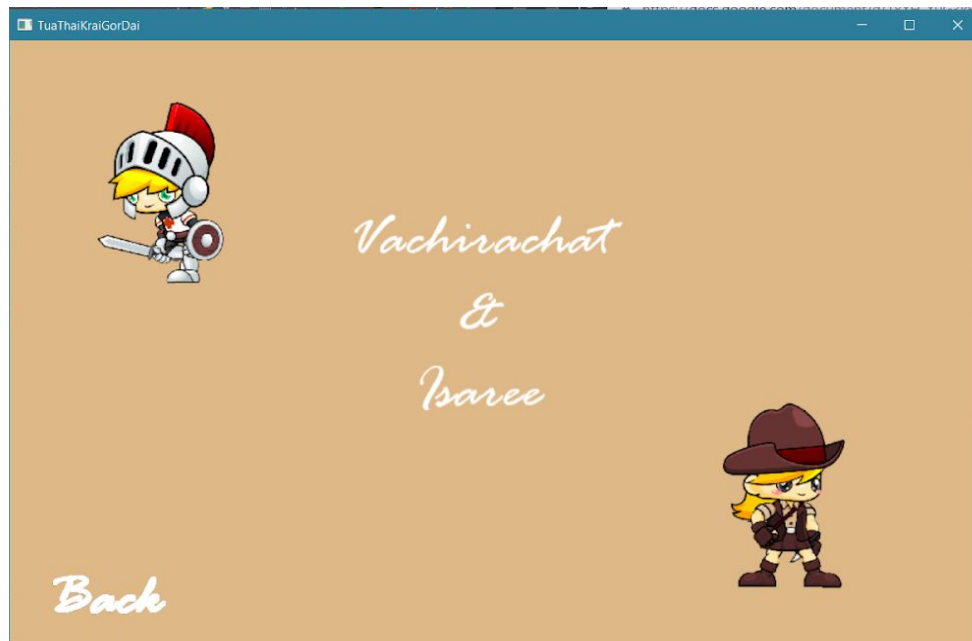


To start the game, click on the play button.

To exit the game, click on exit button.

To see the name generator, click on credit button.

Credit Window



Click on back button(bottom left) to back to start window.

GameWindow (For two players)



- Main view is the view that shows everything in the current map. Background image, monsters, players and particles are shown in this area. Main view's area occupies the whole screen (including status bar area)
- Status bar is the place where the player's properties are shown. The following list are the properties that status bar shows.

- Current level
- Current HP and max HP
- Current experience points
- Skills and its cooldown
- Score is the place that showing current score.
- Knight and cowgirl are the player.

Game Control

Knight's control

- Move left: A
- Move right: D
- Move up: W
- Move down: S
- Use skill1: Q
- Use skill2: E

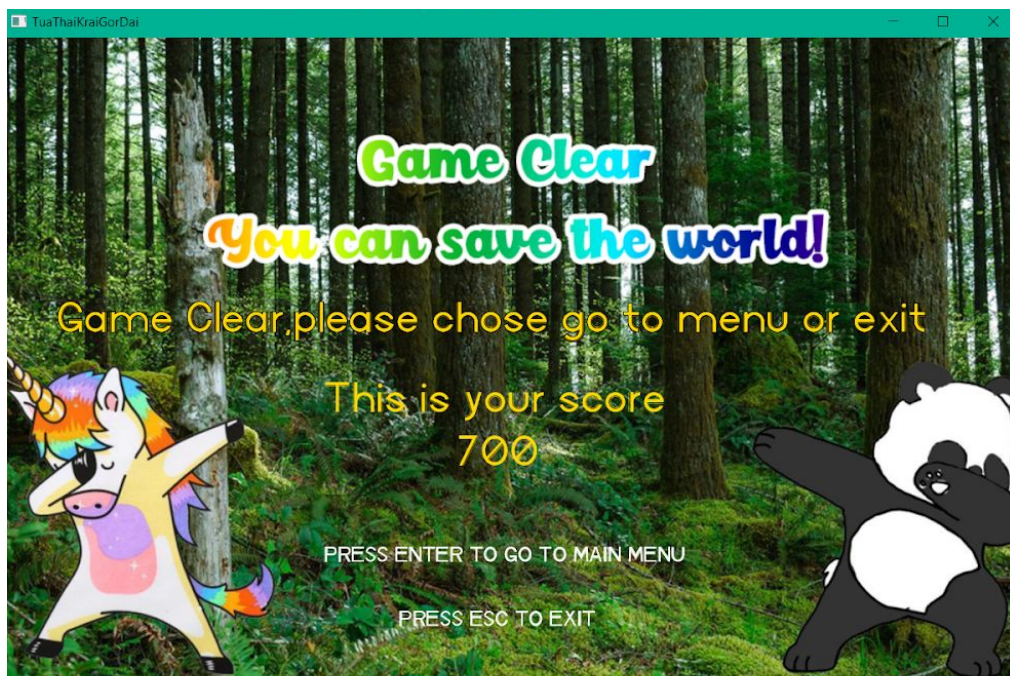
Cowgirl's control

- Move left: ←
- Move right: →
- Move up: ↑
- Move down: ↓
- Use skill1: N
- Use skill2: M

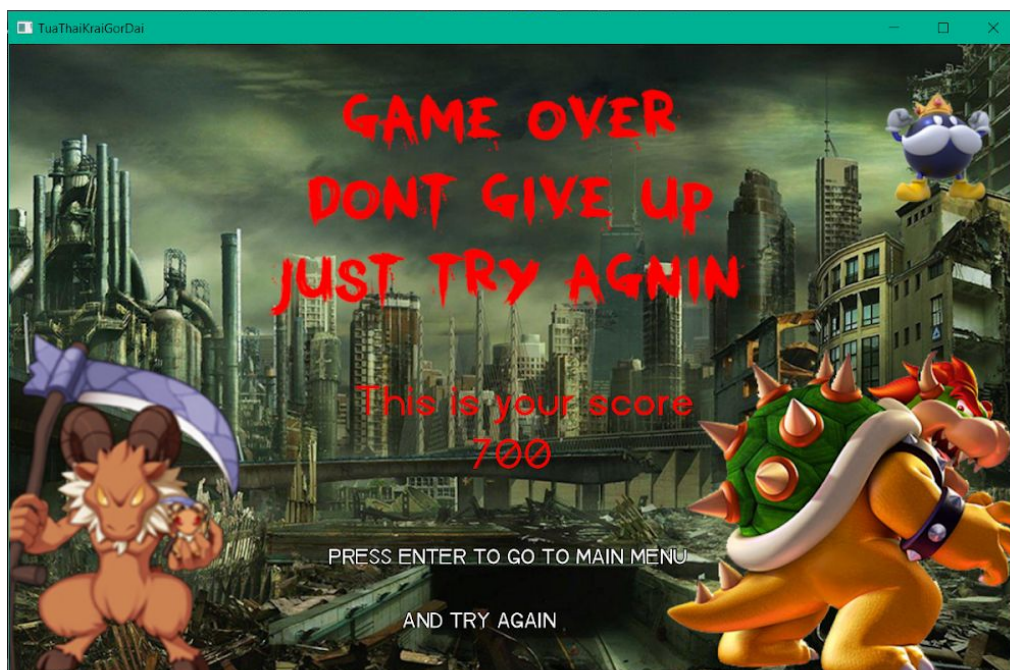
Monster

| | Minion | | Boss |
|---|-----------|--|------------|
|  | 1. ninja |  | 1. robot |
|  | 2. zombie |  | 2. pumpkin |
|  | 3. cowboy |  | 3. dino |

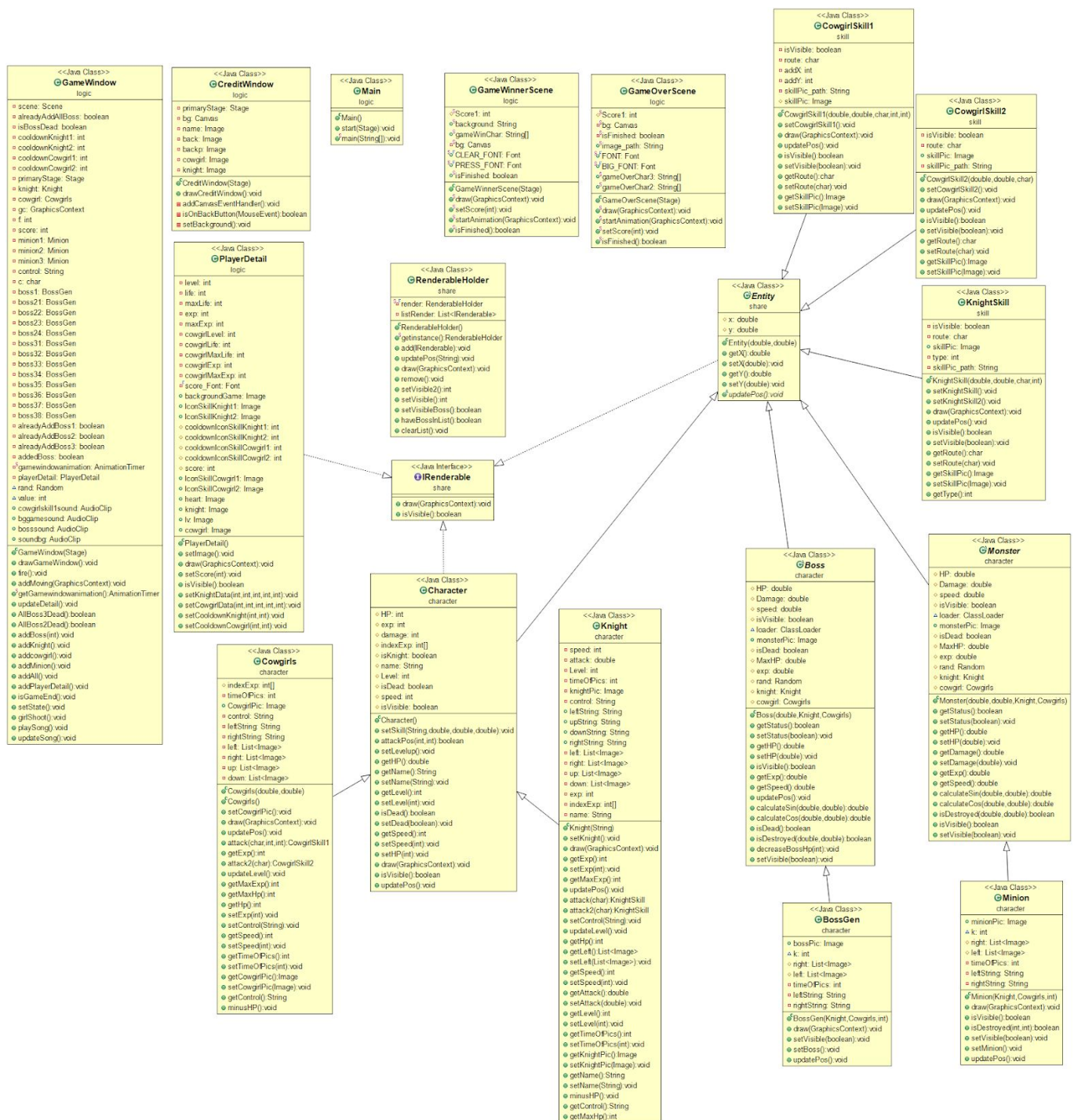
GameWinnerScene



GameOverScene



UML Diagram



Class Detail

1. Package logic

1.1 Class Main extends Application

1.1.1 Method

| | |
|----------------------------------|---|
| + void start(Stage primaryStage) | The main entry point for the JavaFX applications. |
| + void main(String[] args) | An entry point of the application |

1.2 Class StartWindow

1.2.1 Field

| | |
|--------------------------|--|
| - Stage primaryStage | Stage from Main got from constructor |
| - Canvas bg | canvas of this screen |
| - GraphicsContext gc | GraphicsContext from the bg |
| - Image background | background of the screen |
| - Image name | Plate of Game's Name |
| - Image pbutton | Button for start game |
| - Image pbuttonfade | Button when mouse on start button |
| - Image exitButton | Button to exit game |
| - Image exitButtonfade | Button when mouse on exit button |
| - Image creditButton | Button to go to credit's page |
| - Image creditButtonfade | Button when mouse on credit button |
| + AudioClip soundbg | sound of the bg that will be initialize in the constructor |

1.2.2 Constructor

| | |
|-----------------------------------|--|
| + StartWindow(Stage primaryStage) | Initialize canvas for bg and gc. Also Initialize soundbg and then play it. |
|-----------------------------------|--|

1.2.3 Method

| | |
|--------------------------------------|--|
| + void draw(GraphicsContext gc) | Starts background and effect |
| + void setBackground() | set the background image on the canvas and the title of the game |
| - boolean isOnPlayButton(MouseEvent) | Return true when mouse cursor is on start button |
| - boolean isOnExitButton | Return true when mouse cursor |

| | |
|--|---|
| (MouseEvent) | is on exit button |
| - boolean isOnCreditButton (MouseEvent) | Return true when mouse cursor is on credit button |
| - void addCanvasEventHandler() | Handle animation canvas when moving or clicking on button when clicking on button |
| + void startAnimation() | Call the method draw to start |

1.3 Class CreditWindow extends Canvas

1.3.1 Field

| | |
|----------------------|-------------------------------------|
| - Stage primaryStage | Stage from StartWindow |
| - Canvas bg | canvas of this screen |
| - Image name | Show name text |
| - Image back | Button for back to StartWindow |
| - Image backp | Button when mouse on back button |
| - Image cowgirl | Cowgirl's image for decorate |
| - Image knight | Knight's image for decorate |

1.3.2 Constructor

| | |
|------------------------------------|--------------------------|
| + CreditWindow(Stage primaryStage) | Initialize canvas for bg |
|------------------------------------|--------------------------|

1.3.3 Methods

| | |
|---|---|
| + void drawCreditWindow() | Starts background |
| - void addCanvasEventHandler() | Handle animation canvas when moving or clicking on button when clicking on button |
| - boolean isOnBackButton(MouseEvent) | Return true when mouse cursor is on back button |
| - void setBackground() | set the background image on the canvas |

1.4 Class PlayerDetail implements IRenderable

1.4.1 Field

| | |
|---------------------------------|---|
| - int level | knight's level |
| - int life | knight's life |
| - int maxLife | knight's maxlife |
| - int exp | knight's exp |
| - int maxExp | knight's maxexp |
| - int cowgirlLevel | Cowgirl's level |
| - int cowgirlLife | Cowgirl's life |
| - int cowgirlMaxLife | Cowgirl's maxlife |
| - int cowgirlExp | Cowgirl's exp |
| - int cowgirlMaxExp | Cowgirl's maxexp |
| - Font score_Font | Font for player detail |
| + Image backgroundGame | background image |
| + Image IconSkillKnight1 | Image of the the skillknight1 |
| + Image IconSkillKnight2 | Image of the the skillknight2 |
| # int cooldownIconSkillKnight1 | Count for cooldown time for the SkillKnight1 |
| # int cooldownIconSkillKnight2 | Count for cooldown time for the SkillKnight2 |
| # int cooldownIconSkillCowgirl1 | Count for cooldown time for the SkillCowgirl1 |
| # int cooldownIconSkillCowgirl2 | Count for cooldown time for the SkillCowgirl2 |
| # int score | Counting current score |
| + Image IconSkillCowgirl1 | Image of the the skillcowgirl1 |
| + Image IconSkillCowgirl2 | Image of the the skillcowgirl2 |
| + Image heart | Image of heart |
| + Image knight | knight's icon |

| | |
|-----------------|----------------|
| + Image lv | Image of arrow |
| + Image cowgirl | Cowgirl's icon |

1.4.2 Methods

| | |
|--|---|
| + void setImage() | Initialize backgroundgame |
| + void draw(GraphicsContext gc) | To show players detail |
| + void setScore(int score) | setting the score for the parameter that given in this method for updating the screen |
| + boolean isVisible() | PlayerDetail's always use to update the screen for every second so this method always return true. |
| + void setKnightData(int maxExp,int exp,int level,int maxLife,int life) | setting the field for the parameter that given in this method for updating the screen about the knight's data. |
| + void setCowgirlData(int maxExp,int exp,int level,int maxLife,int life) | setting the field for the parameter that given in this method for updating the screen about the cowgirl's data. |
| + void setCooldownKnight(int cooldownKnight1,int cooldownKnight2) | Initialize the image for the skillKnight. If the cooldown is not equal to zero. this method should set the image with the cooldown (graycolor picture). If not , use the original one. |
| + void setCooldownCowgirl(int cooldownKnight1,int cooldownKnight2) | Initialize the image for the skillCowgirl. If the cooldown is not equal to zero. this method should set the image with the cooldown (graycolor picture). If not , use the original one. |

1.5 Class GameWindow extends Canvas

1.5.1 Field

| | |
|-----------------------------|------------------------------|
| - Scene scene | scene from Main of this game |
| - boolean alreadyAddAllBoss | Check that all boss is added |
| - boolean isBossDead | Check that boss is dead |

| | |
|---|--|
| - int cooldownKnight1 | Count for cooldown time for the knightSkill1 |
| - int cooldownKnight2 | Count for cooldown time for the knightSkill2 |
| - int cooldownCowgirl1 | Count for cooldown time for the cowgirlSkill1 |
| - int cooldownCowgirl2 | Count for cooldown time for the cowgirlSkill2 |
| - Stage primaryStage | primaryStage from Main of this game |
| - Knight knight | for initialize knight in the method addKnight |
| - Cowgirls cowgirl | for initialize cowgirl in the method addCowgirl |
| - GraphicsContext gc | GraphicsContext of the canvas |
| - int f | It counts the time to spawn monsters or items |
| - int score | For counting score |
| - Minion1 minion1 | for initialize minion1 in the method addMinion |
| - Minion2 minion2 | for initialize minion2 in the method addMinion |
| - Minion3 minion3 | for initialize minion3 in the method addMinion |
| - String control | the string that contains the direction of the hero's direction |
| - char c | To tell the direction of the initial direction |
| - Boss1 boss1 | for initialize Boss1 in the method addBoss |
| - Boss2 boss21,boss22,boss23,boss2 | for initialize Boss2 in the method addBoss |
| - Boss3 boss31,boss32,boss33,boss34,bo | for initialize Boss3 in the method addBoss |

| | |
|---|---|
| ss35, boss36, boss37, boss38 | |
| - boolean alreadyAddBoss1 | Adding boss1 in the game |
| - boolean alreadyAddBoss2 | Adding boss2 in the game |
| - boolean alreadyAddBoss3 | Adding boss3 in the game |
| - boolean addedBoss | Adding boss in the game |
| - AnimationTimer gamewindowanimation | use for running animation on this window |
| - PlayerDetail playerDetail | for initialize playerdetail in the method addPlayerDetail |
| - Random rand | for random the number of value |
| - int value | Value of minion |
| + AudioClip cowgirlskill1sound | sound when the player press skill |
| + AudioClip bggamesound | sound for the originalgame |
| + AudioClip bossound | Sound when the boss comes out |
| + AudioClip soundbg | Sound for gameover or gamewinnerscene |

1.5.3 Methods

| | |
|---------------------------------------|--|
| + void drawGameWindow() | -call add moving - set frame = 0 - create animation timer instance which will call updateDetail() updatestate updateSong and isGameEnd() |
| + void fire() | If cowgirlskill was pressed the bullets will come out in 8 directions |
| + void addMoving (GraphicsContext gc) | set key event handlers and interactions with the game |
| + void updateDetail() | Update frame count , spawn monster and add skills on the appropriate frame, remove and draw objects in RenderableHolder. Call methods in RenderableHolder, |

| | |
|-------------------------------|--|
| | set exp and lv of hero , Call set Hero data on game screen , check skill's cooldown. |
| + boolean AllBoss3Dead() | Check that all boss3 is dead |
| + boolean AllBoss2Dead() | Check that all boss2 is dead |
| + void addBoss(int countBoss) | Create new Boss instance and add it to RenderableHolder |
| + void addKnight() | Create knight instance and add it to RenderableHolder |
| + void addcowgirl() | Create cowgirl instance and add it to RenderableHolder |
| + void addMinion() | Create new monster instance and add it to RenderableHolder |
| + void addAll() | Call addPlayerDetail(), addKnight(), addcowgirl() and addMinion(); |
| + void addPlayerDetail() | Create new PlayerDetail instance and add it to RenderableHolder |
| + void isGameEnd() | Check if game is end, draw GameOver canvas if game over or draw GameWinner canvas if defeated the Boss . |
| + void setState() | Set monster speed , hero speed and monster amount according to the gametsate |
| + void girlShoot() | Set cowgirlskill moving |
| + void playSong() | Play songs |
| + void updateSong() | Update the current song |

1.6 Class GameWinnerScene

1.6.1 Field

| | |
|------------------------|-----------------------------------|
| # int Score1 | score which you get while playing |
| + String background | background of this Class |
| + String[] gameWinChar | have the String "Game Clear, |

| | |
|----------------------|---|
| | Please chose go to menu or exit” in the array of char to call each by each when the animation starts |
| - Canvas bg | canvas of this screen |
| - Stage primaryStage | Stage from previous window |
| - GraphicsContext gc | GraphicsContext from bg |
| + Font CLEAR_FONT | Font of Score and Game Clear used in the method draw |
| + Font PRESS_FONT | Font of the sentence “PRESS ENTER TO GO TO MAIN MENU” used in the method draw |
| + boolean isFinished | true if the animation is finished |

1.6.2 Constructor

| | |
|--|--------------------------|
| + GameWinnerScene(Stage primaryStage) | Initialize canvas for bg |
|--|--------------------------|

1.6.3 Methods

| | |
|---|---|
| + void draw(GraphicsContext gc) | starts the animationTimer for drawing the background and start animations that will show “Game Clear, Please chose go to menu or exit” by each char. When it shows all the string , then show the sentence “PRESS ENTER TO GO TO MAIN MENU” and “PRESS ESC TO EXIT” |
| + void setScore(int score) | Set your final score to show on the scene |
| + void startAnimation (GraphicsContext gc) | call the method draw to start the animationTimer |
| + boolean isFinished() | True if the AnimationTimer is finished all of the function in draw |

1.7 Class GameOverScene

1.7.1 Field

| | |
|--------------------------|--|
| # int Score1 | score which you get while playing |
| - Canvas bg | canvas of this screen |
| - boolean isFinished | true if the animation is finished |
| + String image_path | background of this Class |
| + Font FONT | Font of the sentence "PRESS ENTER TO GO TO MAIN MENU AND TRY AGAIN" |
| + Font BIG_FONT | Font of score and sentence "This is your score" |
| + String[] gameOverChar3 | have the String "PRESS ENTER TO GO TO MAIN MENU" in the array of char to call each by each when the animation starts |
| + String[] gameOverChar2 | have the String "AND TRY AGAIN" in the array of char to call each by each when the animation starts |

1.7.2 Constructor

| | |
|-------------------------------------|--------------------------|
| + GameOverScene(Stage primaryStage) | Initialize canvas for bg |
|-------------------------------------|--------------------------|

1.7.3 Methods

| | |
|--|---|
| + void draw(GraphicsContext gc) | starts the animationTimer for drawing the background and start animations that will show "PRESS ENTER TO GO TO MAIN MENU AND TRY AGAIN" by each char. |
| + void startAnimation (GraphicsContext gc) | call the method draw to start the animationTimer |
| + boolean isFinished() | True if the AnimationTimer is finished all of the function in draw |

2. Package character

2.1 Class Character extends Entity

2.1.1 Field

| | |
|---------------------|-----------------------------------|
| # int HP | Hero's hp. |
| # int exp | Hero's exp. |
| # int damage | Hero's damage |
| # int [] indexExp | Contain maxexp for each level |
| # boolean isKnight | Check that this is knight or not |
| # int Level | hero's level. Set initial to 1. |
| # boolean isDead | Check if the life of Hero |
| # int speed | The speed of the hero |
| # boolean isVisible | Check that hero is visible or not |

2.1.2 Constructor

| | |
|---------------|--|
| + Character() | - Initialize the position of the hero x = 100 and y = 100 - Set initial hero's exp to 0. |
|---------------|--|

2.1.3 Methods

| | |
|--|---|
| + void setSkill(String skillName,double damage,double manaUse,double cooldown) | |
| + void setLevelUp() | increase Level of hero by 1 |
| + void draw(GraphicsContext gc) | |
| + boolean isVisible() | |
| + void updatePos() | |
| Getters and setters for all field | In setHP(int hp) method, isVisible will be false if hp<=0 |

2.2 Class Knight extends Character

2.2.1 Field

| | |
|---------------------|--|
| - int speed | The speed of the knight |
| - int Level | Knight's level. Set initial to 1. |
| - int timeOfPics | count the time the hero is drawn on the screen. |
| - Image knightPic | Image of the hero drawn on the screen. |
| - String control | String that contain chars which will indicate the direction knight's moving. |
| - List<Image> left | List of images of knight walking to the left |
| - List<Image> right | List of images of knight walking to the right |
| - List<Image> up | List of images of knight walking up |
| - List<Image> down | List of images of knight walking down |
| - int exp | knight's exp. Set initial to 0. |
| - int [] indexExp | Contain maxhp for each level |

2.2.2 Constructor

| | |
|-----------------------|--|
| + Knight(String name) | <ul style="list-style-type: none">- Initialize the position of knight- add all images of knight to the left right up down arraylist.- Initialize hp of knight- call setKnight() |
|-----------------------|--|

2.2.3 Methods

| | |
|---------------------------------|---|
| + void setKnight() | Set initial knightpic |
| + void draw(GraphicsContext gc) | <ul style="list-style-type: none">- Increase the time by 1.\- if time >=30 set time = 0- draw image of knight. |
| + void updatePos() | Update current position of knight. |

| | |
|-----------------------------------|---|
| | The position will update according to the char in the string control and speed of knight. Also, set the knightpic according to the time the knight is drawn(to make knight walk) and the char in the string control (the direction of knight) |
| + KnightSkill attack(char c) | Using knightskill1 to the monsters |
| + KnightSkill attack2(char c) | Using knightskill2 to the monsters |
| + void updateLevel() | If exp of hero exceeding maxexp increase level by 1 set exp to 0 and increase maxexp |
| + void minusHP() | Decrease hero's hp when monster attack |
| + int getMaxHP() | Get max hp from 150+(Level*50) |
| Getters and setters for all field | |

2.3 Class Cowgirls extends Character

2.3.1 Field

| | |
|---------------------|--|
| # int [] indexExp | Contain maxhp for each level |
| - int timeOfPics | count the time the hero is drawn on the screen. |
| + Image CowgirlPic | Image of the hero drawn on the screen. |
| - String control | String that contain chars which will indicate the direction knight's moving. |
| - List<Image> left | List of images of cowgirl walking to the left |
| - List<Image> right | List of images of cowgirl walking to the right |
| - List<Image> up | List of images of cowgirl walking up |
| - List<Image> down | List of images of cowgirl walking down |

2.3.2 Constructor

| | |
|-------------------------|--|
| + Cowgirls(String name) | <ul style="list-style-type: none"> - Initialize the position of cowgirl - add all images of cowgirl to the left right up down arraylist. - Initialize hp of cowgirl - call setCowgirlPic() |
|-------------------------|--|

2.3.3 Methods

| | |
|--|---|
| + void setCowgirlPict() | Set initial cowgirlpic |
| + void draw(GraphicsContext gc) | <ul style="list-style-type: none"> - Increase the time by 1.\ - if time >=30 set time = 0 - draw image of cowgirl. |
| + void updatePos() | Update current position of cowgirl. The position will update according to the char in the string control and speed of cowgirl. Also, set the cowgirlpic according to the time the cowgirl is drawn(to make cowgirl walk) and the char in the string control (the direction of cowgirl) |
| + CowgirlSkill1 attack(char c,int addX,int addY) | Using cowgirlskill1 to the monsters |
| + CowgirlSkill2 attack2(char c) | Using cowgirlskill2 to the monsters |
| + void updateLevel() | If exp of hero exceeding maxexp increase level by 1 set exp to 0 and increase maxexp |
| + int getMaxHp() | Get max hp from 50+(Level*50) |
| + void minusHP() | Decrease hero's hp when monster attack |
| Getters and setters for all field | |

2.4 Class Monster extends Entity

2.4.1 Field

| | |
|---------------------|---------------------------------------|
| # double HP | Monster's hp |
| # double Damage | Monster's damage |
| # double speed | Speed of monster |
| # boolean isVisible | Tell that the monster is drawn or not |
| + Image monsterPic | Image of monster |
| # boolean isDead | Check if monster is dead |
| # double MaxHP | Max hp of monster |
| # double exp | Give hero exp |
| # Random rand | Create random instance |
| # Knight knight | Instance of Hero Knight |
| # Cowgirls cowgirl | Instance of Hero Cowgirls |

2.4.2 Constructor

| | |
|--|--|
| + Monster(double hp, double damage, Knight knight, Cowgirls cowgirl) | Set field to the corresponding parameters and set sponde monster at different position |
|--|--|

2.4.3 Methods

| | |
|--|---|
| + boolean isVisible() | Check that monster is drawn on the screen or not. |
| + boolean isDestroyed(int x,int y) | Set if position x and position y of knight/cowgirl/skill come nearer than 20 , set isVisible to false |
| + double calculateSin(double charX,double charY) | Calculate sin value of the angle of the distance of hero and monster. |
| + double calculateCos(double charX,double charY) | Calculate cos value of the angle of the distance of hero and monster. |
| Getters and setters for all field | |

2.5 Class Minion extends Monster

2.5.1 Field

| | |
|---------------------|---|
| + Image minionPic | Image of the minion drawn on the screen. |
| + int k | Random number 0 or 1 If k=0, this monster will follow knight. If k=1, this monster will follow cowgirl |
| # List<Image> right | List of images of minion walking to the right |
| # List<Image> left | List of images of minion walking to the left |
| - int timeOfPics | count the time the minion is drawn on the screen. |

2.5.2 Constructor

| | |
|--|---|
| + Minion(Knight knight,Cowgirls cowgirl, int type) | <ul style="list-style-type: none">- add all images of minion to the left right arraylist.- check that if one player is dead then follow another one- call setMinion() |
|--|---|

2.5.3 Methods

| | |
|--------------------------------------|---|
| + void draw(GraphicsContext gc) | <ul style="list-style-type: none">- Increase the time by 1.\- if time >=30 set time = 0- draw image of minion. |
| + boolean isVisible() | Check that monster is drawn on the screen or not. |
| + boolean isDestroyed(int x,int y) | Set if position x and position y of knight/cowgirl/skill come nearer than 20 , set isVisible to false |
| + void setVisible(boolean isVisible) | Set isVisible value |
| + void setMinion() | Initialize monster image |
| + void updatePos() | Set position of monster which will eventually move towards the |

| | |
|--|-------|
| | hero. |
|--|-------|

2.8 Class Boss extends Entity

2.8.1 Field

| | |
|---------------------|---------------------------------------|
| # double HP | Boss's hp |
| # double Damage | Boss's damage |
| # double speed | Speed of Boss |
| # boolean isVisible | Tell that the monster is drawn or not |
| + Image monsterPic | Image of boss |
| # boolean isDead | Check if boss is dead |
| # double MaxHP | Max hp of นก |
| # double exp | Give hero exp |
| # Random rand | Create random instance |
| # Knight knight | Instance of Hero Knight |
| # Cowgirls cowgirl | Instance of Hero Cowgirls |

2.8.2 Constructor

| | |
|---|--|
| + Boss(double hp, double damage, Knight knight, Cowgirls cowgirl) | Set field to the corresponding parameters and set sponde monster at different position |
|---|--|

2.8.3 Methods

| | |
|--|---|
| + boolean isVisible() | Check that monster is drawn on the screen or not. |
| + boolean isDead() | If boss's hp < 0 , return true |
| + void decreaseBossHp(int damage) | Decrease boss's hp when boss is attacked by knight/cowgirl |
| + boolean isDestroyed(int x,int y) | Set if position x and position y of knight/cowgirl/skill come nearer than 20 , set isVisible to false |
| + double calculateSin(double charX,double charY) | Calculate sin value of the angle of the distance of hero and |

| | |
|--|---|
| | monster. |
| + double calculateCos(double charX,double charY) | Calculate cos value of the angle of the distance of hero and monster. |
| Getters and setters for all field | |

2.9 Class BossGen extends Boss

2.9.1 Field

| | |
|---------------------|---|
| + Image bossPic | Image of the boss drawn on the screen. |
| + int k | Random number 0 or 1 If k=0, this monster will follow knight. If k=1, this monster will follow cowgirl |
| # List<Image> right | List of images of boss walking to the right |
| # List<Image> left | List of images of boss walking to the left |
| - int timeOfPics | count the time the boss is drawn on the screen. |

2.9.2 Constructor

| | |
|--|--|
| + Boss(Knight knight,Cowgirls cowgirl, int type) | <ul style="list-style-type: none"> - add all images of minion to the left right arraylist. - check that if one player is dead then follow another one - call setRobot() |
|--|--|

2.9.3 Methods

| | |
|------------------------------------|--|
| + void draw(GraphicsContext gc) | <ul style="list-style-type: none"> - Increase the time by 1. - if time >=30 set time = 0 - draw image of boss. |
| + boolean isVisible() | Check that monster is drawn on the screen or not. |
| + boolean isDestroyed(int x,int y) | Set if position x and position y of knight/cowgirl/skill come nearer |

| | |
|--------------------------------------|--|
| | than 20 , set isVisible to false |
| + void setVisible(boolean isVisible) | Set isVisible value |
| + void setBoss() | Initialize monster image |
| + void updatePos() | Set position of monster which will eventually move towards the hero. |

3. Package share

3.1 Class Entity

3.1.1 Field

| | |
|------------|----------------------------------|
| # double x | Position in x axis of an entity. |
| # double y | Position in y axis of an entity. |

3.1.2 Constructor

| | |
|------------------------------|----------------------------------|
| + Entity(double x, double y) | Initialize x and y |
| + Entity() | Default constructor for entities |

3.1.3 Methods

| | |
|-----------------------------------|---|
| + abstract void updatePos() | An abstract method for an entities' position update |
| Getters and setters for all field | |

3.2 Class IRenderable

3.2.1 Methods

| | |
|---------------------------------|--|
| + void draw(GraphicsContext gc) | |
| + boolean isVisible() | |

3.3 Class RenderableHolder

3.3.1 Field

| | |
|----------------------|----------------------------------|
| + RenderableHolder() | Initialize object for this Class |
|----------------------|----------------------------------|

3.3.2 Constructor

| | |
|--------------------------------|---|
| - RenderableHolder render | singleton of the RenderableHolder class |
| - List<IRenderable> listRender | List of all IRenderable item |

3.3.3 Methods

| | |
|----------------------------------|---|
| + RenderableHolder getInstance() | getter of render |
| + void add(IRenderable i) | add IRenderable item into the listRender |
| + void updatePos(String control) | Only the things that have movement (Surely have method updatePos) will call updatePos method |
| + void draw(GraphicsContext gc) | Everything in the object are call method draw |
| + void remove() | If the the things in the object is set isVisible to be false , it will be removed from the object |
| + int setVisible2() | Set monsters is collide by skill from knight. |
| + int setVisible | Set monsters is collide by skill from cowgirl. |
| + boolean setVisibleBoss() | Set boss is collide by skill from hero. |
| + void clearList() | Clear all the list in object and initialize the new one |

4. Package skill

4.1 Class CowgirlSkill1 extends Entity

4.1.1 Field

| | |
|---------------------|---|
| - boolean isVisible | Tell that this entity is drawn on the screen or not |
| - char route | use to tell the direction skill's moving |
| + Image skillPic | Image of the skill |

| | |
|------------|---------------------|
| - int addX | Position X of skill |
| - int addY | Position Y of skill |

4.1.2 Constructor

| | |
|---|--|
| + CowgirlSkill1(double x,double y,char route,int addX,int addY) | - Set field to the corresponding parameters - Initialize the position and the direction of the skill and set the picture of the skill |
|---|--|

4.1.3 Methods

| | |
|---|--|
| + void setCowgirlSkill1() | Set the picture of the skill |
| + void draw(GraphicsContext gc) | Draw the skill on the canvas |
| + void updatePos() | Change the position of the skill according to the direction also set visible false if the position is out of the area. |
| Getters and setters for isVisible, route and SkillPic | |

4.2 Class CowgirlSkill2 extends Entity

4.2.1 Field

| | |
|---------------------|---|
| - boolean isVisible | Tell that this entity is drawn on the screen or not |
| - char route | use to tell the direction skill's moving |
| + Image skillPic | Image of the skill |

4.2.2 Constructor

| | |
|---|--|
| + CowgirlSkill2(double x,double y,char route) | - Set field to the corresponding parameters - Initialize the position and the direction of the skill and set the picture of the skill |
|---|--|

4.2.3 Methods

| | |
|---|--|
| + void setCowgirlSkill2() | Set the picture of the skill |
| + void draw(GraphicsContext gc) | Draw the skill on the canvas |
| + void updatePos() | Change the position of the skill according to the direction also set visible false if the position is out of the area. |
| Getters and setters for isVisible, route and SkillPic | |

4.3 Class KnightSkill extends Entity

4.3.1 Field

| | |
|---------------------|---|
| - boolean isVisible | Tell that this entity is drawn on the screen or not |
| - char route | use to tell the direction skill's moving |
| + Image skillPic | Image of the skill |
| - int type | Type of knight skill |

4.3.2 Constructor

| | |
|--|--|
| + KnightSkill(double x,double y,char route,int type) | <ul style="list-style-type: none">- Set field to the corresponding parameters- Initialize the position and the direction of the skill- If type=0, set the picture of the knightSkill1. If type=1, set the picture of the knightSkill2. |
|--|--|

4.3.3 Methods

| | |
|---------------------------------|--|
| + void setKnightSkill() | Set the picture of the skill1 |
| + void setKnightSkill2() | Set the picture of the skill2 |
| + void draw(GraphicsContext gc) | Draw the skill on the canvas |
| + void updatePos() | Change the position of the skill according to the direction also set visible false if the position is out of |

| | |
|--|-----------|
| | the area. |
| Getters and setters for isVisible, route, type and SkillPic | |