

PEWPEW PROGMETH

1. Introduction

In this game, you are playing as a Magical girl whose duty is to save the world from the villains. One day you found out that there was a mad scientist who are planning to do something really evil so you decided to invade his lab to catch and stop him from whatever he will going to do.

2. Game Control

On StartWindow



Figure 1

Use Spacebar to interact with the window. At Start, press Spacebar to enter the main menu of the game. After that, you can choose to start game or exit by pressing the arrow keys up and down. The instruction that was choose will be surrounded by a black stroke rectangle. Also you can press R to change music.



Figure 2

On GameWindow

Use the arrow keys ($\leftarrow \uparrow \rightarrow \downarrow$) to control the direction of the character that you play. Press spacebar to fire.

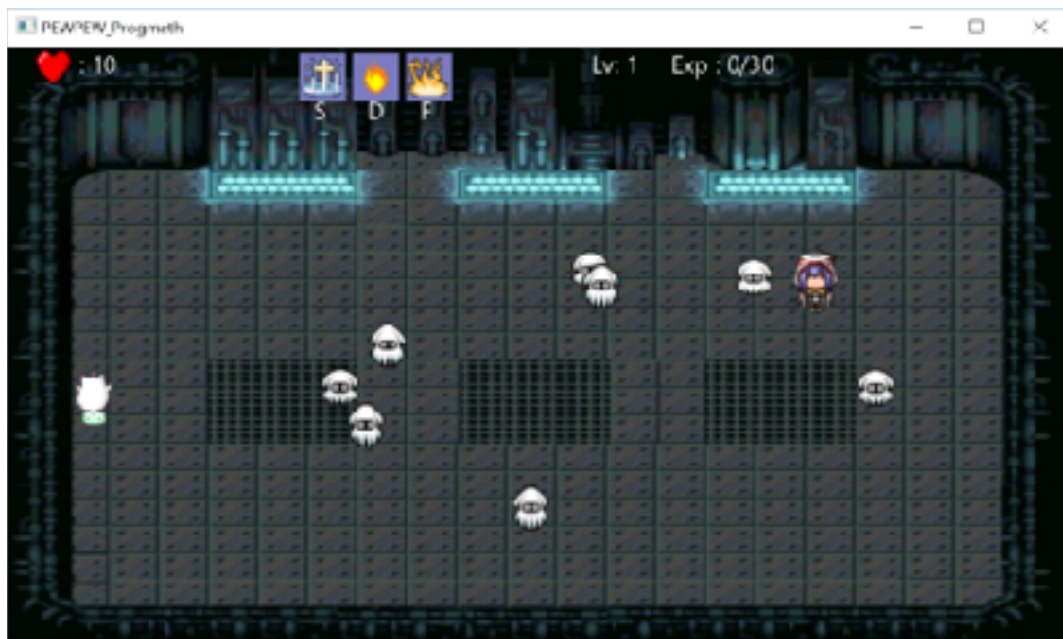


Figure 3

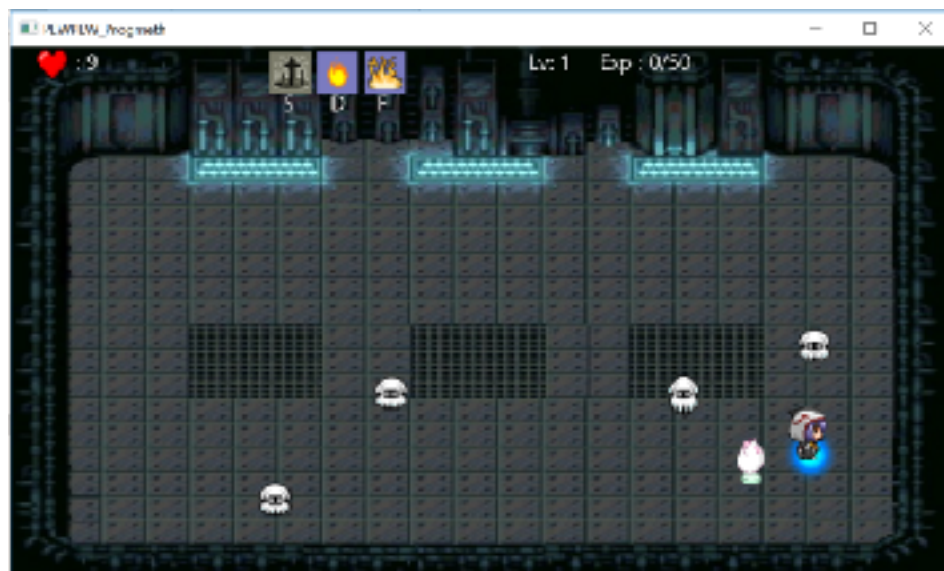


Figure 4

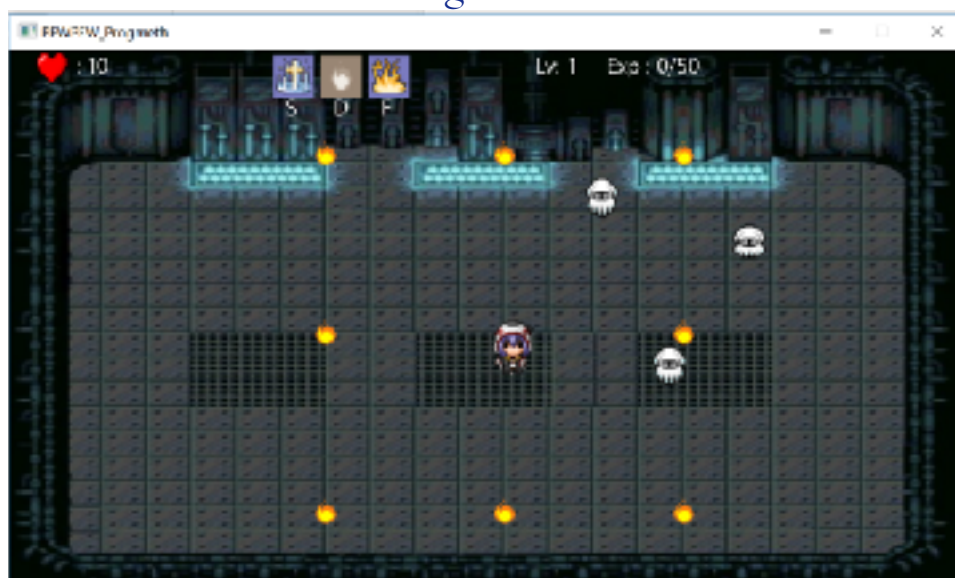


Figure 5

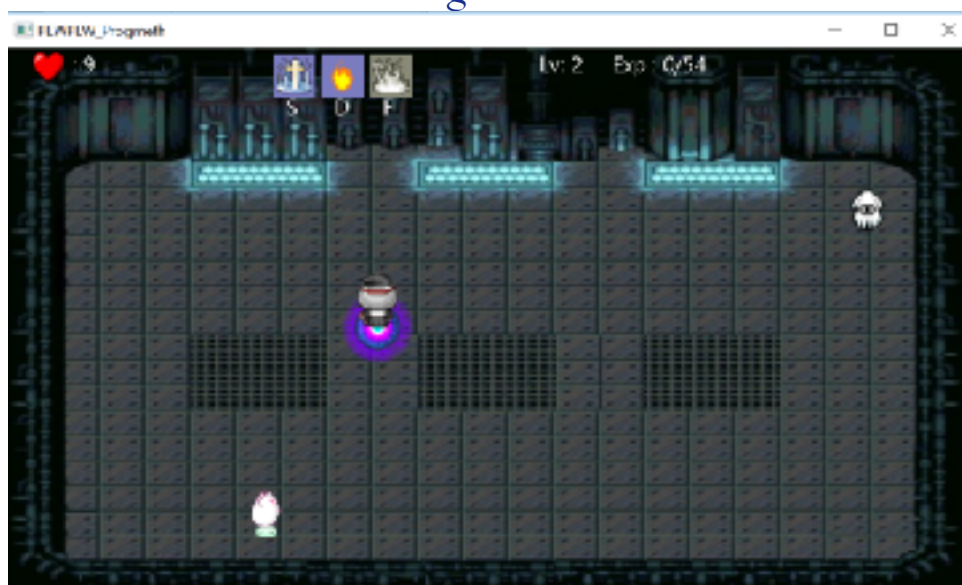


Figure 6

You can also press S to use barrier skill (Figure 4), press D to use fireball skill (Figure 5) and press F to use Ultimate skill (Figure 6). The skills have a cooldown time so you can use it once in a while. When the skill is cooldown, the skill icon will become Grey. You can use it again when the skill icon become colored again. The heart on the top left show the remain life of the character.

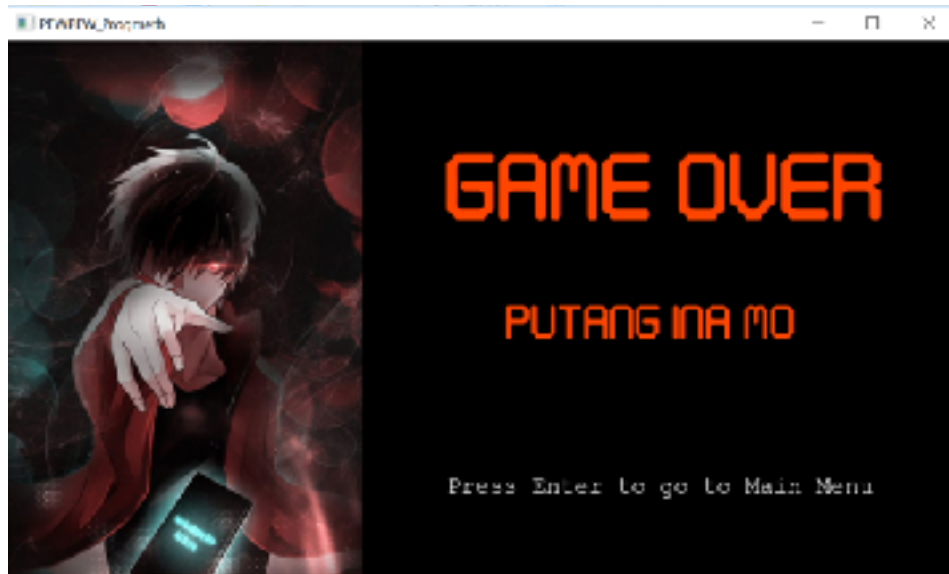
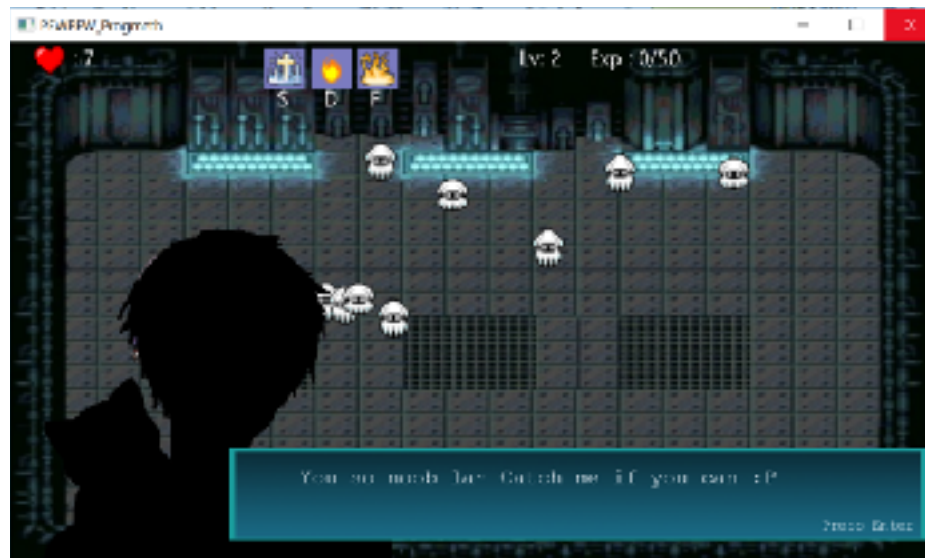


Figure 7

When the character is attacked by the monster, the life will decrease by 1. If the life become zero, game over. The “GameOver” word will be shown on the screen and then the game will show the GameOver window with the blinking text. You can press enter to go back to main start window.

In the figure 3 you can see the spinning cat on the left side of the screen. If you run through that, you will gain life by 1. The spinning cat will show intermittently on the random position for the screen for amount of time and then disappear.

The exp of the character is shown on the top right. If the exp reach the max value. The character will level up. Higher the level the game will become harder.



When the hero reached the appropriate level, the stage of the game will change. Every time the stage change, there will be a dialog from the boss and the game will become harder and harder.

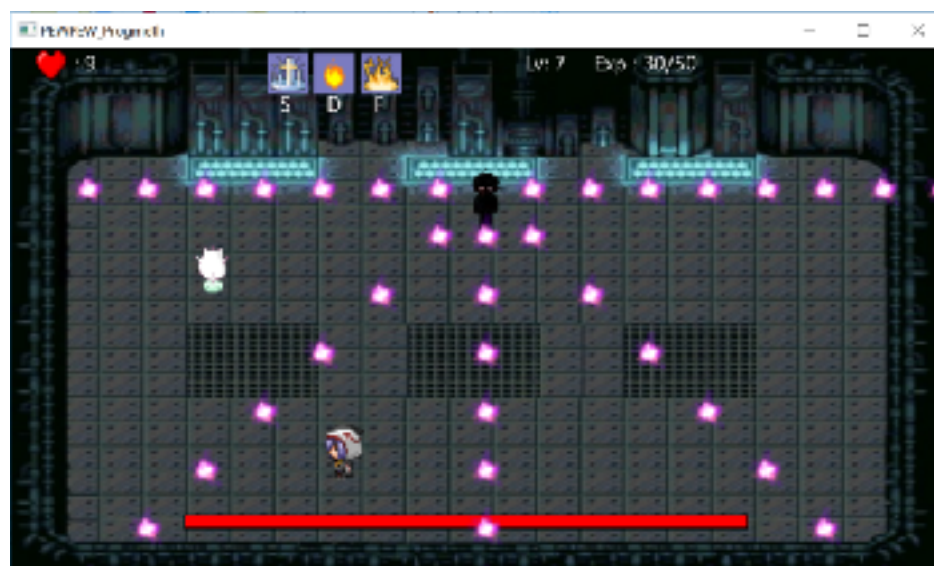
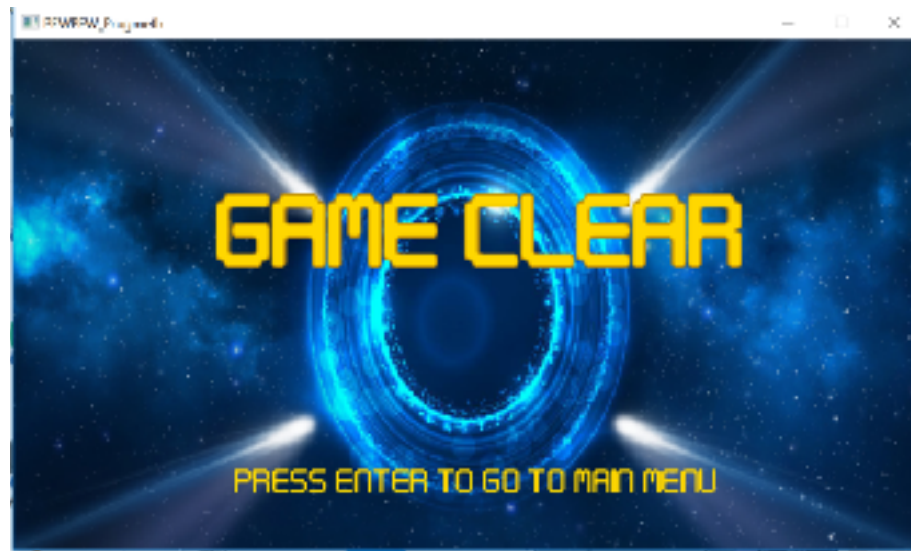


Figure 8

When character reach level 7. You will meet the boss of the game. The boss will warp in to different position intermittently and will spawn bullets in three directions. Your life will decrease by one every time you are attacked by the bullet. The red bar on the bottom is the Life bar of the boss. The Boss life will decrease “Only when you fire bullets on the headshot”. If you can kill the Boss the “Game Clear” window will appear.



3. Game Controls

Press ← to move left

Press ↑ to move up

Press ↓ to move down

Press → to move right

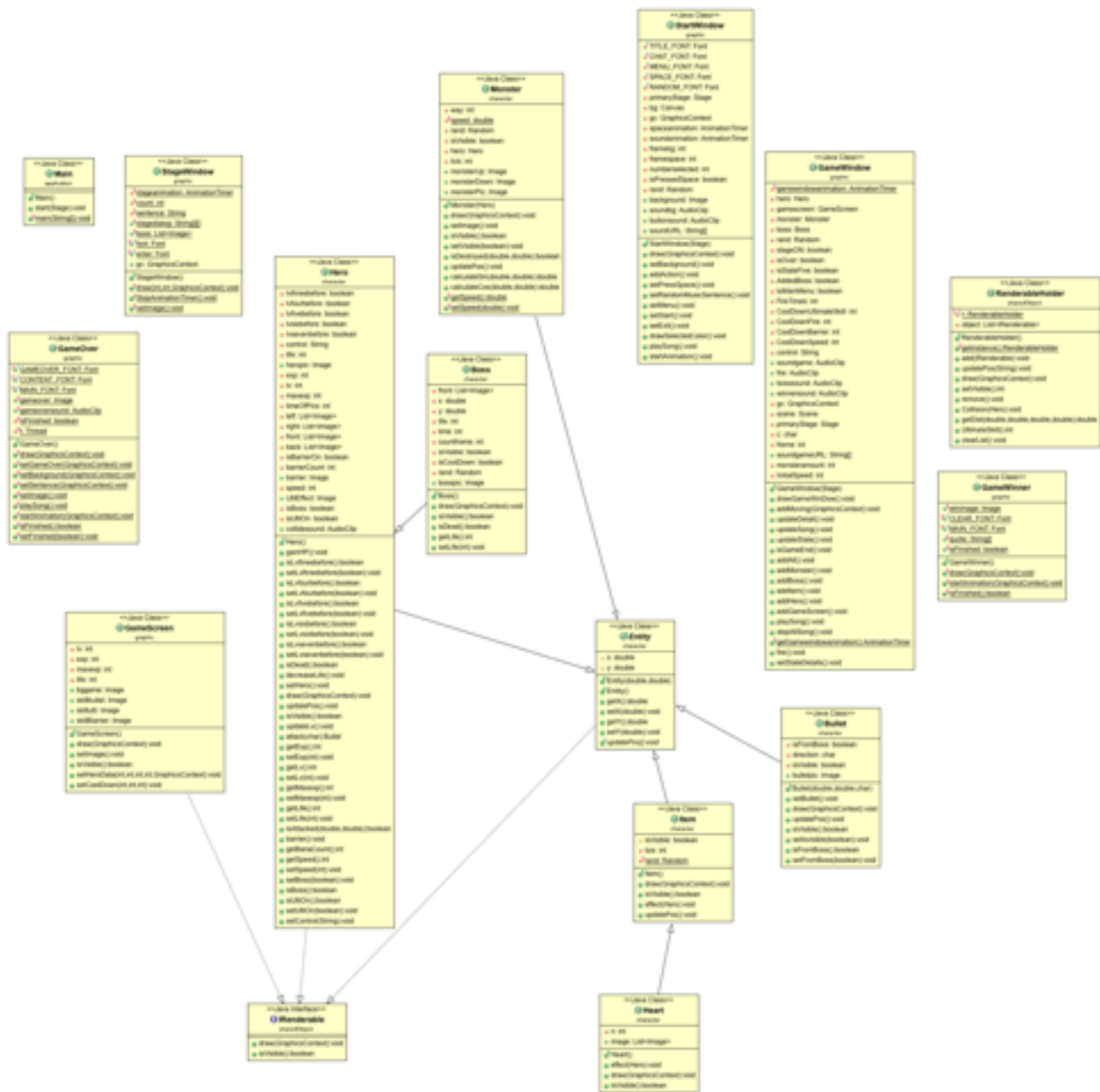
Press space bar to fire – the bullets will be fired on the direction the player is facing

Press S to use barrier skill. The effect of the barrier skill is when the monster hit you your life will not be decrease for 3 times.

Press D to use 8 directions bullets skill - the effect of this skill is the hero will spawn the 8 directions bullets for 3 times automatically.

Press F to use Ultimate skill – the effect of this skill is it will clear all the monsters on the map and the speed of the player will increase for amount of time. (NOTED THAT ULTIMATE SKILL CAN'T USE WITH THE BOSS)

4. UML Diagram



5. Class Details - Methods - Constructor -Fields

5.1 Package application

5.1.1 Class `Main` extends `Application`

5.1.1.1 Method

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

5.2.1 Class Entity

5.2.1.1 Field

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

5.2.1.2 Constructor

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

5.2.1.3 Method

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

5.2.2 Class Bullet extends Entity

5.2.2.1 Field

- char direction	use to tell the direction bullet's moving
- boolean isVisible	Tell that this entity is drawn on the screen or not
- boolean isFromBoss	Tell that the bullet is from boss or not
+ Image bulletpic	Image of the bullet

5.2.2.2 Constructor

+ Bullet(double x, double y, char direction)	Initialize the position and the direction of the bullet And set the picture of the bullet
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5.2.2.3 Method

+ void setBullet()	Set the picture of the bullet
+ void draw(GraphicsContext gc)	Draw the bullet on the canvas
+ void updatePos()	Change the position of the bullet according to the direction also set visible false if the position is out of the area.
Getters and setters for isFromBoss and isVisible variables	

5.2.3 Class Hero extends Entity

5.2.3.1 Field

- boolean lvthreebefore	Check that LV of the hero has exceeded 3.
- boolean lvfourbefore	Check that LV of the hero has exceeded 4.
- boolean lvfivebefore	Check that LV of the hero has exceeded 5.
- boolean lvsixbefore	Check that LV of the hero has exceeded 6.
- boolean lvsevenbefore	Check that LV of the hero has exceeded 7.
- String control	String that contain chars which will indicate the direction character's moving.
- int life	Hero's life .Set initial to 10.
+Image heropic	Image of the hero drawn on the screen.
- int exp	Hero's exp. Set initial to 0.
- int lv	Hero's level. Set initial to 1.
- int maxexp	Hero's exp. Set initial to 50.
- int timeOfPics	count the time the hero is drawn on the screen.
- List<Image> left	List of images of hero walking to the left

- List<Image> right	List of images of hero walking to the right
- List<Image> front	List of images of hero walking to the front
- List<Image> back	List of images of hero walking to the left back
- boolean isBarrierOn	Check if Barrier of the hero is on.
- int barrierCount	Count how many times the barrier is used.
+ Image barrier	Image of the barrier.
- int speed	The speed of the character.
+ Image UltiEffect	Image of the UltimateSkill.
- boolean isBoss	Check if this hero is Boss or not .
- boolean isUltiOn	Check if the skill UltimateSkill is on.
+ AudioClip collidesound	The sound when hero is attacked by monster.

5.2.3.2 Constructor

+ Hero()	<ul style="list-style-type: none"> - Initialize the position of the hero x = 400 and y = 225 - add all images of hero to the left right front back arraylist. - call setHero();
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5.2.3.3 Method

+ void gainHP()	Increase life by 1
+ boolean isDead()	Check if the life of Hero is 0
+ void decreaseLife()	Decrease life by 1
+ void setHero()	Set initial heropic

+ void draw(GraphicsContext gc)	<ul style="list-style-type: none"> - Increase the time by 1.\ - if time ≥ 30 set time = 0 - Check if Barrier skill is on if yes draw barrier at hero position - Check if UltimateSkill is on if yes draw Ulti effect at hero position. - draw image of hero.
+ void updatePos()	<p>If this hero isn't boss, update current position of this hero. The position will update according to the char in the string control and speed of the hero. Also, set the heropic according to the time the hero is drawn(to make hero walk) and the char in the string control (the direction of hero) .Also, check if the position of the hero is in the map.</p>
+ boolean isVisible()	Check if the hero is visible
+ void updateLv()	<p>If exp of hero exceeding maxexp increase lv of hero by 1 set exp to 0 and increase maxexp by $2 * \text{level}$.</p>
+ Bullet attack(char c)	<p>Create bullet instance with x and y of hero and direction of bullet, Added to RenderableHolder. If this hero is boss. Set bullet from Boss.</p>
+ boolean isAttacked(double x, double y)	<p>If monster is near than 25 decrease life by 1, Also, play collidesound . However, if the skill Barrier is on the hero will still safe. Decrease BarrierCount by 1 and if BariaCount = 0 , termiate the skill .</p>
+ void barrier()	<p>Set isBarrier on true and set BarrierCount to 3.</p>

Getters and setters for lvthreebefore, lvfourbefore, lvfivebefore, lvsixbefore, lvsevenbefore, exp, lv, maxexp, life, speed, isBoss, isUltiOn and getter of barrierCount and also setter of control	
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5.2.4 Class Monster extends Entity

5.2.4.1 Field

- int way	Indicate where the monster will come out
- boolean isVisible	Tell that the monster is drawn or not
- double speed	Speed of monster
- Random rand	Create random instance
- Hero hero	Instance of Hero
- int tick	Count how many times the monster is drawn
+Image monsterUp	Initialize image of monster
+Image monsterDown	Initialize image of monster
+Image monsterPic	Image of monster

5.2.4.2 Constructor

+ Monster(Hero hero)	Set way value by random number of one to four and set
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5.2.4.3 Method

+ void draw(GraphicsContext gc)	Draw monster by using (tick/20)%2 to indicate to draw monsterUp image or monsterDown image. Increase tick by 1
+ void setImage()	Initialize monster image
+ boolean isVisible()	Check that monster is drawn on the screen or not.

+ boolean isDestroyed(double x , double y)	Set if position x and position y of bullet come nearer than 20 , set isVisible to false
+ void setVisible()	Set isVisible value
+ void updatePos()	<ul style="list-style-type: none"> - Set position of monster which will eventually move towards the hero. - Check if this monster attack the hero , if yes , set isVisible false.
+ double calculateSin(double herox , double heroy)	Calculate sin value of the angle of the distance of hero and monster.
+ double calculateCos(double herox , double heroy)	Calculate cos value of the angle of the distance of hero and monster.
Getter and Setter for monster speed	

5.2.5 Class Item extends Entity

5.2.5.1 Field

#boolean isVisible	Set the value to true. Indicate that this item is on the screen or not.
- int tick	Count the time the item will be shown on the screen. Set to 200
- Random rand	Create Random instance

5.2.5.2 Constructor

+ Item()	Set x and y by random value which isn't exceed the area of map
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5.2.5.3 Method

+ void draw(GraphicsContext gc)	
+ void effect (Hero hero)	

+ void updatePos()	- decrease the tick by 1 - if tick's value below 0 , set isVisible false
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5.2.6 Class Boss extends Hero

5.2.6.1 Field

- List<Image> front	Initialize ArrayList
- double x	Position x of Boss , Initialize 400
- double y	Position y of Boss , Initialize 100
- int life	Boss's Life . Initialize 20
- int time	Indicate when the Boss will spawn bullet.
- int countframe	Count frame to make Boss walk
- boolean isVisible	Check that the boss is drawn on the screen or not.
-boolean isCoolDown	Checked that Boss's cooldown is finished or not
- Random rand	Create Random instance
+Image bosspic;	Boss's Image

5.2.6.2 Constructor

+Boss()	- Set x and y value - call setBoss(In superclass) and set true - Add boss's images to front
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5.2.6.3 Method

+ void draw	<ul style="list-style-type: none">- draw Image of the Boss walking by access the front list use countframe as index- draw the hp bar of the boss- spawn bullet when time value%5 is 0- if time%15 = 0 increase count frame by 1- when the time value reach 100 set isCoolDown to true- when the time value reach 150 random new Boss's position and set isCoolDown to false. Set time = 0- Increase time by 1- set countframe to 0 if countframe exceeds 3
+ boolean isVisible()	Check if Boss is drawn on the screen or not
+ boolean isDead()	Check if Boss's life become 0 or lower
Getter and Setter of life	

5.2.7 Class Heart extends Item

5.2.7.1 Field

- int n	Count many time this was drawn.
+List<Image> image	Initialize arraylist.

5.2.7.2 Constructor

+ Heart()	Add images of item into image list
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5.2.7.3 Method

+ void effect(Hero hero)	Call hero.gainHP() Set isVisible to false
+void draw(GraphicsContext gc)	Draw Image of the spinning item using n as index in image arraylist
+ boolean isVisible()	Check if this is drawn on the screen or not

5.3 Package graphic

5.3.1 Class GameOver

5.3.1.1 Field

+ Font GAMEOVER_FONT	Font use for the title “GAMEOVER”
+ Font CONTENT_FONT	Font use for the method setSentence in the part of the title “putang ina mo”
+ Font MAIN_FONT	Font use for the method setSentence in part of “go to main menu”
+ Image gameover	background of this class
+ AudioClip gameoversound	Sound plays when the player’s hp less than or equal to 0
- boolean isFinished	Tell that is Thread in this Class is finished or not
- Thread t	Thread that use for animation in this class

5.3.1.2 Method

+ void draw(GraphicsContext gc)	Initialize Thread and start to start the Animation
+ void setGameOver(GraphicsContext gc)	Set the string “GAME OVER” after the play’s died

+ void setBackground(GraphicsContext gc)	Draw background with black colour and the image on the left side with Text “GAME OVER”
+ void setSentence(GraphicsContext gc)	Draw text “putang ina mo” on the right and side and below this text will have the text “Please Enter to go to Main Menu”
+ void setImage()	set Image gameover
+ void playSong()	When call this method , gameoversound will play.
+ void startAnimation(GraphicsContext gc)	This method will call the method draw to start the animation
Getter & Setter method for isFinished	

5.3.2 Class GameScreen implements IRenderable

5.3.2.1 Field

- int lv	hero’s level
- int exp	hero’s exp
- int maxexp	hero’s maxexp
- int life	hero’s life
+ Image bggame	background image for the GameScreen
+ Image skillbullet	Image of the the skill Bullet
+ Image skillulti	Image of the skill Ulti
+ Image skillBarrier	Image of the skill Barrier

5.3.2.2 Constructor

+ GameScreen()	Initialize bggame by calling method setImage
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5.3.2.3 Method

+ void draw(GraphicsContext gc)	Initiali
+ void setImage()	Initialize bggame

+ boolean isVisible()	GameScreen's always use to update the screen for every second so this method always return true.
+ void setHeroData(int lv,int exp,int maxexp,int life,GraphicsContext gc)	setting the field for the parameter that given in this method for updating the screen about the hero's data.
+ void setCoolDown(int CoolDownFire , int CoolDownBarrier , int CoolDownUltimateSkill)	Initialize the image for the skill. If the cooldown is not equal to zero. this method should set the image with the cooldown (gray-color picture). If not , use th original one.

5.3.3 Class GameWindow extends Canvas

5.3.3.1 Field

- AnimationTimer gamewindowanimation	use for running animation on this window
- Hero hero	for initialize hero in the method addHero
- GameScreen gamescreen	for initialize gamescreen in the method addGameScreen
- Monster monster	for initialize monster in the method addMonster
- Boss boss	for initialize boss in the method addBoss
- Random rand	for random the number for the song that will play on this window
- boolean StageON	is true when the StageWindow is calling
- boolean isOver	is true when the hero's dead or the game is finished (boss's dead)
- boolean isStateFive	for checking that it's the state to call the boss
- boolean AddedBoss	Adding boss in the game (only 1 boss will be add in this game)

- boolean toMainMenu	is true if the game is end so that when the user press enter. Player can go to the Main menu (StartWindow)
- int FireTimes	for counting the frame of the Fire Skill
- int CoolDownUltimateSkill	Count for cooldown time for the Ultimate Skill
- int CoolDownFire	Count for cooldown time for Fire Skill
- int CoolDownBarrier	Count for cooldown time for the Barrier Skill
- int CoolDownSpeed	Count for cooldown time for the Speed Skill
- String control	
- GraphicsContext gc	
- Scene scene	scene from Main of this game
- Stage primaryStage	primaryStage from Main of this game
- char c = 'a'	To tell the direction of the initial direction
- int frame = 0	It counts the time to spawn monsters or items
- int monsteramount	Tell amount of monsters are spawned at each round
- int InitialSpeed	Initial speed for the hero's speed
+ AudioClip soundgame	sound for the originalgame
+ AudioClip fire	sound when the player press spacebar
+ AudioClip bosssound	sound when it's state five and boss is spawned
+ AudioClip winnersound	sound when the player wins the game. It's will play when the GameWinner is called

5.3.3.2 Method

+ void drawGameWinDow()	-call add moving - set frame = 0 - create animation timer instance which will call updateDetail() upDatestate updateSong and isGameEnd()
+ void addMoving(GraphicsContext gc)	set key event handlers for system testing , moving hero(ArrowKeys) , fire bullets(spacebar) , using skills(S for barrier , D for 8 directions fire , and F for ultimate skill) , and interactions with the game .
+ void updateDetail()	Update frame count , spawn monster and add bullets don 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.
+ void updateSong()	Update the current song
+ void updateState()	Update game state according to the hero level.
+ void isGameEnd()	Check if game is end, draw GameOver canvas if game over or draw GameWinner canvas if defeated the Boss .
+ void addAll()	Call addGameScreen() addHero() and addMonster();
+ void addMonster()	Create new monster instance and add it to RenderableHolder
+ void addBoss()	Create new Boss instance and add it to RenderableHolder set AddedBoss to true
+ void addItem()	Create new Heart instance and add it to RenderableHolder
+ void addHero()	Create new Hero instance and add it to RenderableHolder
+ void addGameScreen()	Create new GameScreen instance and add it to RenderableHolder
+ void playSong()	Play songs randomly
+ void stopAllSong()	Stop song.
void fire()	If fire skill was pressed the bullets will come out in 8 direactions 3 times

+ void drawGameWinDow()	-call add moving - set frame = 0 - create animation timer instance which will call updateDetail() upDatestate updateSong and isGameEnd()
+ void addMoving(GraphicsContext gc)	set key event handlers for system testing , moving hero(ArrowKeys) , fire bullets(spacebar) , using skills(S for barrier , D for 8 directions fire , and F for ultimate skill) , and interactions with the game .
+ void updateDetail()	Update frame count , spawn monster and add bullets don 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.
+ void updateSong()	Update the current song
+ void updateState()	Update game state according to the hero level.
+ void isGameEnd()	Check if game is end, draw GameOver canvas if game over or draw GameWinner canvas if defeated the Boss .
+ void addAll()	Call addGameScreen() addHero() and addMonster();
+ void addMonster()	Create new monster instance and add it to RenderableHolder
+ void addBoss()	Create new Boss instance and add it to RenderableHolder set AddedBoss to true
+ void addItem()	Create new Heart instance and add it to RenderableHolder
+ void addHero()	Create new Hero instance and add it to RenderableHolder
+ void addGameScreen()	Create new GameScreen instance and add it to RenderableHolder
+ void playSong()	Play songs randomly
+ void stopAllSong()	Stop song.
void fire()	If fire skill was pressed the bullets will come out in 8 direactions 3 times

<code>void setStateDetails()</code>	Set monster speed , hero speed and monster amount according to the gametsate
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5.3.4 Class GameWinner

5.3.4.1 Field

+ Image winimage	background of this Class
+ Font CLEAR_FONT	Font of the Title “GAME CLEAR” used in the method draw
+ Font MAIN_FONT	Font of the sentence “PRESS ENTER TO GO TO MAIN MENU” used in the method draw
+ String[] quote	have the String “GAME CLEAR” in the array of char to call each by each when the animation starts
+ boolean isFinished	ture if the animation is finished

5.3.4.2 Method

+ void draw(GraphicsContext gc)	starts the animationTimer for drawing the background and start animations that will show “GAME CLEAR” by each char. When it shows all the string , then show the sentence “PRESS ENTER TO GO TO MAIN MENU” at the Center-Bottom
+ 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

5.3.5 Class StageWindow

5.3.5.1 Field

- AnimationTimer stageanimation	AnimationTimer of the StageWindow
- int count	count the number that which char should be show
- String sentence	it is the string that show in the dialog box. it is updated in the method draw inside animationTimer.
+ String[][] stagedialog	Array of char of all the string of each stage.
+ List<Image> boss	List of all image of the boss
+ Font font	Font for the quote said by boss in the dialog box.
+ Font enter	Font for the string “Press Enter” at the bottom-right of the dialog box
+ GraphicsContext gc	GraphicsContext from the GameScreen that will get from the constructor

5.3.5.2 Method

+ void draw(int stage,int numboss,GraphicsContext gc)	starts the animationTimer for drawing the dialog box for the boss and the sentence inside of it.
+ void StopAnimationTimer()	for stopping stageanimation
+ void setImage()	Initialize Image for the boss. it has two picture with original boss and the black one.

5.3.6 Class StartWindow

5.3.6.1 Field

+ Font TITLE_FONT	Font for the Game’s Name
+ Font MENU_FONT	Font for Menu’s Name (“Start”,”End”)

+ Font SPACE_FONT	Font for the sentence “Press Spacebar to Enter the Main Menu” at the first screen that shows when we call the StartWindow
+ Font RANDOM_FONT	Font for the string “Press R to random the music” on the top-right of the screen
- Stage primaryStage	Stage from Main got from constructor
- Canvas bg	canvas of this screen
- GraphicsContext gc	GraphicsContext from the bg
- AnimationTimer spaceanimation	animation on the start that will wink the sentence “Press spacebar to enter the Main Menu”
- AnimationTimer soundanimation	animation for playing the song in the loop when song stops or finishes from playing, it will call method playSong to continue the song
- int framebg	for the effect wink of the string “Press spacebar to enter the Main Menu”. it is used in the method draw
- int framespace	for the effect wink of the string “Press spacebar to enter the Main Menu”. it is used in the method draw
- int numberselected	for the method drawSelectedColor about which menu should have the black rectangle around it
- boolean isPressedSpace	true if the player press spacebar so it will setMainmenu and when the player press spacebar again, it will choose either START or EXIT

- Random rand	For randomizing for the number to choose which song will play
+ Image background	background of the screen
+ AudioClip soundbg	sound of the bg that will be initialize in the constructor
+ AudioClip buttonsound	sound when you press UP or DOWN key when selected on the main menu (choose between “START” and “EXIT”). it’s initialized here.
+ String[] soundURL	URL of all the song that are gonna play in this screen

5.3.6.2 Constructor

+ StartWindow(Stage primaryStage)	Initialize rand for the number of the song that will play on the screen and Initialize canvas for bg and gc. Also Initialize soundbg with the number from the rand and then play it.
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5.3.6.3 Method

+ void draw(GraphicsContext gc)	starts the animation for the background and effect including the song to play
+ void setBackground()	set the background image on the canvas and the title of the game
+ void addAction()	add the KeyEvent on this screen
+ void setPressSpace()	When this window starts the sentence “Press spacebar to enter the main menu” will be on the right-side of the screen with the grey color
+ void setRandomMusicSentence()	set the sentence “Press R to random the music” on the canvas at the top-right of the screen

+ void setMenu()	call the method setStart and setExit to set the menu on the right-side of the screen
+ void setStart()	Set the text “START” on the right-side of the screen and it’s above the text “START”
+ void setExit()	Set the text “EXIT” on the right-side of the screen and it’s under the text “START”
+ void drawSelectedColor()	Draw the black rectangle on the canvas around the “EXIT” or “START” when it’s selected
+ void playSong()	Random the song to play on this Screen
+ void startAnimation()	Call the method draw to start the animation

5.4 Package sharedObject

5.4.1 Class IRenderable

5.4.1.1 Method

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

5.4.2 Class RenderableHolder

5.4.2.1 Field

- RenderableHolder r	singleton of the RenderableHolder class
- List<IRenderable> object	List of all IRenderable item

5.4.2.2 Constructor

+ RenderableHolder()	Initialize object for this class
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5.4.2.3 Method

+ RenderableHolder getInstance()	getter of r
+ void add(IRenderable i)	add IRenderable item into the object
+ 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
+ int setVisible()	Set monsters is collide by bullets from hero. If Yes , set isVisible of monster to be false;
+ void remove()	If the the things in the object is set isVisible to be false , it will be removed from the object
+ void Collision(Hero hero)	To see that boss's bullet collide hero or hero's bullet collide boss or hero collide by item
+ double getDist(double x1,double x2,double y1,double y2)	Calculate distance between two points
+ int UltimateSkill()	Using ultimate skill to the monsters if monsters are on the map. they will be set isVisible to be false.
+ void clearList()	Clear all the list in object and initialize the new one

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