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DPA

1.Introduction

In this game, you are driving a battle spaceship and your main objective is to survive and eliminate the boss which is on the last stage of the game

2. Gameplay

Main menu is the first page when you start the game. To play the game, click on the button "Start". To quit the game, click on the button "Exit".

Figure 1: Main Menu

Before you can play the game, you must select your own battle spaceship. Click on the battle spaceship that you like and click "PLAY!" to start playing the game.

Figure 2: Select Screen

When you start the game, you can control your battle spaceship by pressing W, A, S and D on the keyboard. Your battle spaceship will fire the bullets automatically for you.

Figure 3: Game Screen

There are 4 types of enemies: Meteorite, Suicide Battleship, Battleship with laser gun and the boss. Each of the enemy will move differently, you have to watch out.

-Eliminate or dodging the meteorite will increase your score by 1 point.

-Eliminate Suicide Battleship, Battleship with laser gun and the boss will increase your score by 50, 50 and 10000 points respectively.

Figure 4: Meteorite, Suicide Battleship, Battleship with laser gun and the boss

During the game, there are 4 types of supplies that are shield supply, green ammunition supply, blue ammunition supply and health supply which will help you fight off your enemies. These supplies will affect you when you collect them.
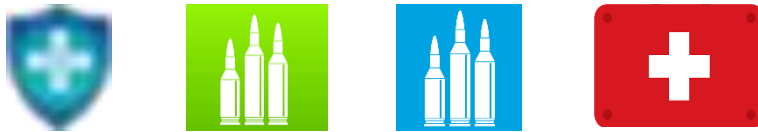

Figure 5: shield supply, green ammunition, blue ammunition and health supply

Shield supply : When you take damage, the damage will be absorbs by the shield for 1 time.

Health supply : Your hp will be increased by 1, your max health is 15.

Green ammunition: Your bullet will be change to green which deal 2 damages and this will also increase the number of bullets you shoot each time to 2 bullets for a fix amount of duration.

Blue ammunition : Your number of bullets which you shoot each time will be change to 3 for a fix amount of duration.

Figure 6: When you got shield

Figure 7: When you got green ammunition

Figure 8: When you got blue ammunition

On the top part of the game screen, your HP, your score and your stage level are displayed there.

Figure 9: The top part of the game screen

If you want to pause the game, you can pause the game by pressing the esc key on the keyboard. You can unpause by pressing spacebar on the keyboard.
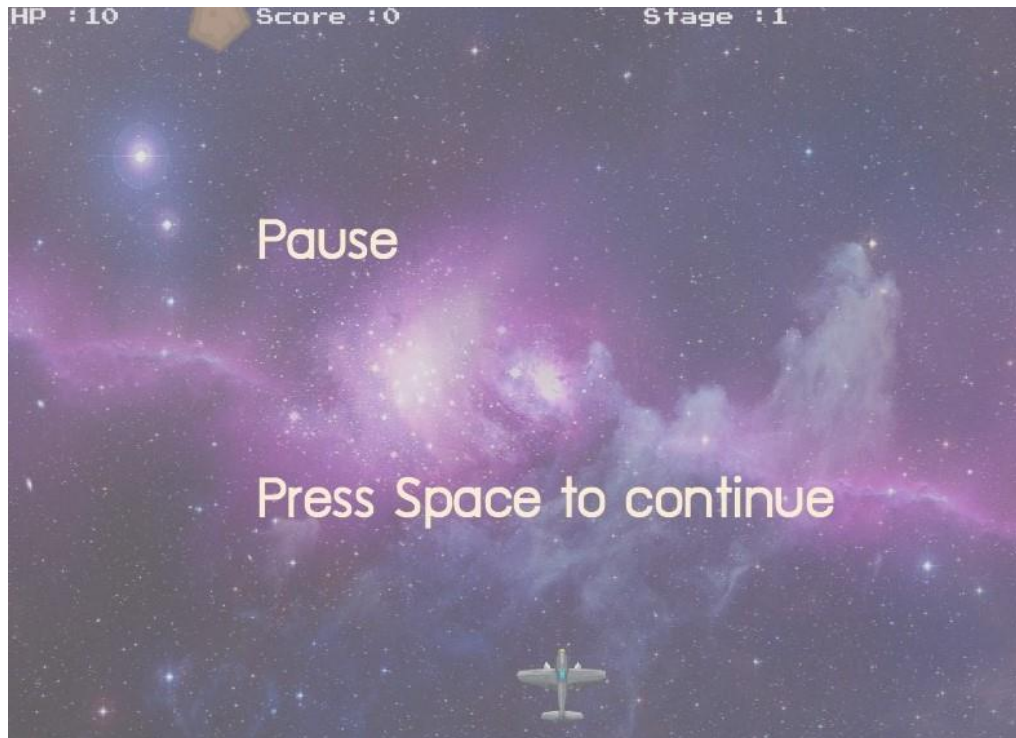
Figure 10: Pause screen

There are 5 stages in this game, the difficulty will increase as stage level increases. The rate of spawning each enemy will be increased and there will also have the new enemy added in some stage level as stage level increases. When you reach stage 5, the boss will be coming for you, and if you can defeat the boss, the game will end and change in to the winner screen which will display your score.

However, if you lose, the screen will change in to game over screen which also display your score.

Figure 11: Winner screen

Figure 12: Game Over screen

You can change from both winner screen and game over screen back to the Main Menu by pressing enter on your keyboard.

3. Key Controls

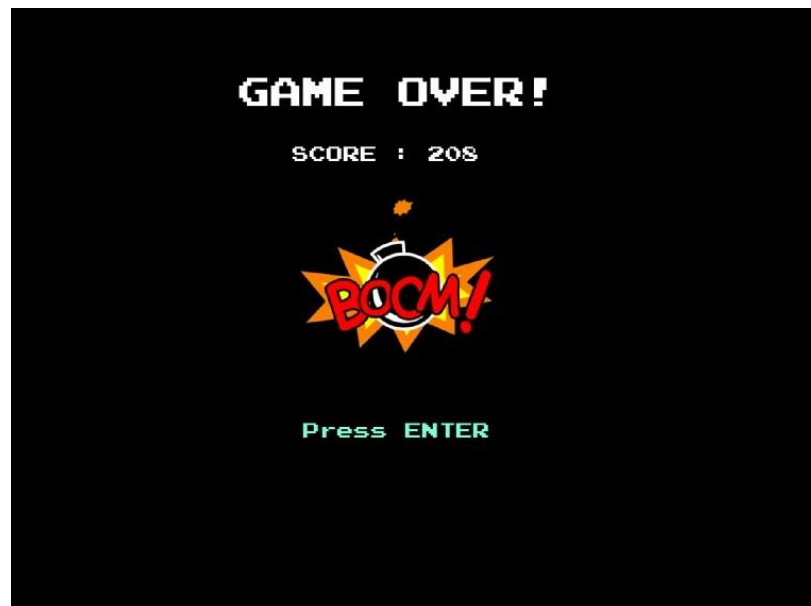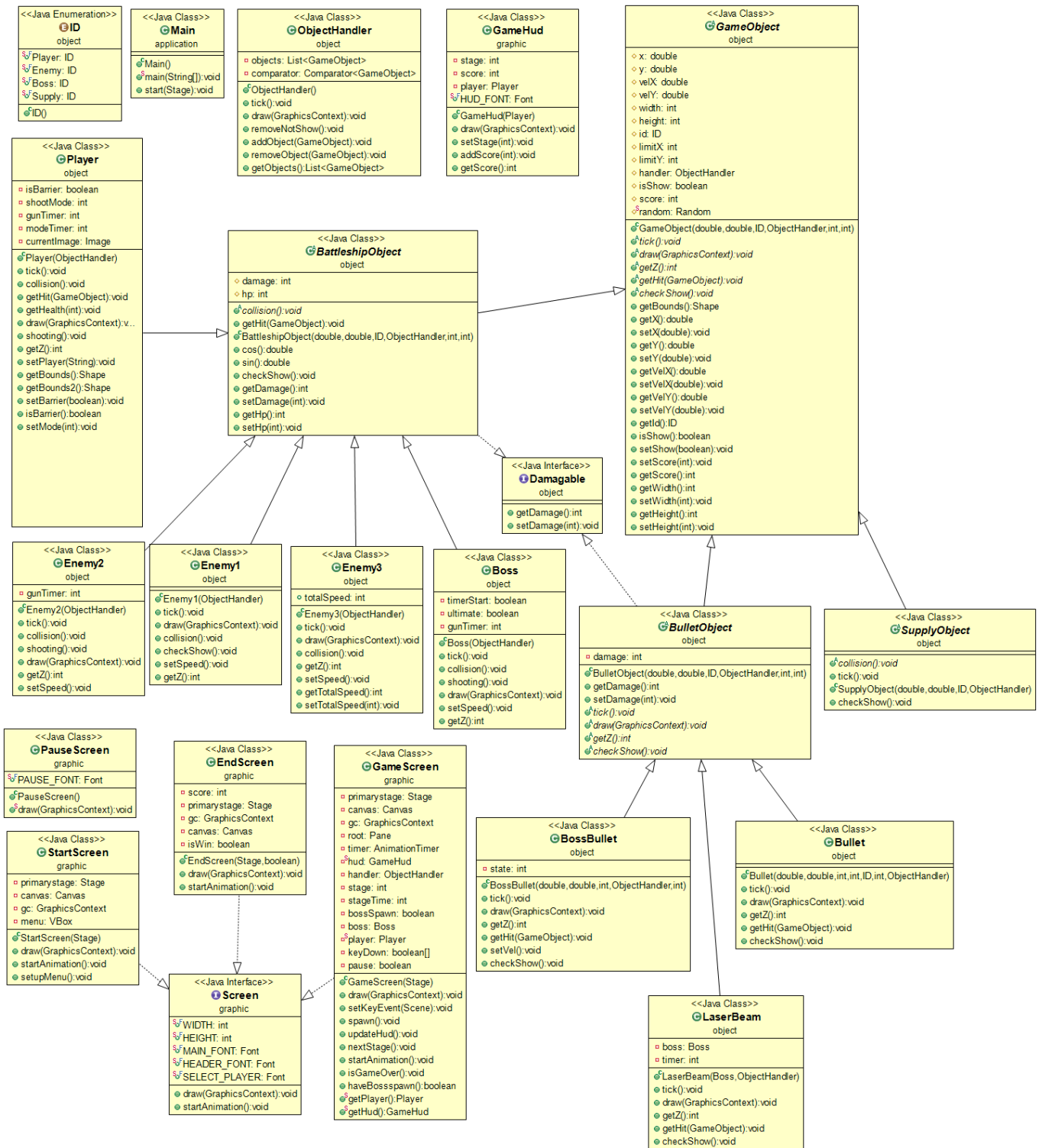| Key	Explanation
W	Move your Battle spaceship up
A	Move your Battle spaceship left
S	Move your Battle spaceship down
D	Move your Battle spaceship right
ESC	Pause

4.UML diagrams

<<Java Enumeration>>
ID
object
- Player: ID
- Enemy: ID
- Boss: ID
- Supply: ID
- ID()

<<Java Class>>
Main
application
- Main()
- main(String[]):void
- start(Stage):void

<<Java Class>>
ObjectHandler
object
- objects: List<GameObject>
- comparator: Comparator<GameObject>
- ObjectHandler()
- tick():void
- removeNotShow():void
- addObject(GameObject):void
- removeObject(GameObject):void
- getObjects():List<GameObject>

<<Java Class>>
GameHud
graphic
- stage: int
- score: int
- player: Player
- HUD_FONT: Font
- GameHud(Player)
- draw(GraphicsContext):void
- setStage(int):void
- addScore(int):void
- getScore():int

<<Java Class>>
GameObject
object
- x: double
- y: double
- velX: double
- velY: double
- width: int
- height: int
- id: ID
- limitX: int
- limitY: int
- handler: ObjectHandler
- isShow: boolean
- score: int
- random: Random
- GameObject(double,double,ID,ObjectHandler,int,int)
- tick():void
- draw(GraphicsContext):void
- getZ():int
- getHit(GameObject):void
- checkShow():void
- getBounds():Shape
- getX():double
- setX(double):void
- getY():double
- setY(double):void
- getVelX():double
- setVelX(double):void
- getVelY():double
- setVelY(double):void
- getId():ID
- isShow():boolean
- setShow(boolean):void
- setScore(int):void
- getScore():int
- getWidth():int
- setWidth(int):void
- getHeight():int
- setHeight(int):void

<<Java Class>>
Player
object
- isBarrier: boolean
- shootMode: int
- gunTimer: int
- modeTimer: int
- currentImage: Image
- Player(ObjectHandler)
- tick():void
- collision():void
- getHit(GameObject):void
- getHealth(int):void
- draw(GraphicsContext):v...
- shooting():void
- getZ():int
- setPlayer(String):void
- getBounds():Shape
- getBounds2():Shape
- setBarrier(boolean):void
- isBarrier():boolean
- setMode(int):void

<<Java Class>>
BattleshipObject
object
- damage: int
- hp: int
- collision():void
- getHit(GameObject):void
- BattleshipObject(double,double,ID,ObjectHandler,int,int)
- cos():double
- sin():double
- checkShow():void
- getDamage():int
- setDamage(int):void
- getHp():int
- setHp(int):void

<<Java Interface>>
Damagable
object
- getDamage():int
- setDamage(int):void

<<Java Class>>
Enemy2
object
- gunTimer: int
- Enemy2(ObjectHandler)
- tick():void
- collision():void
- shooting():void
- draw(GraphicsContext):void
- getZ():int
- setSpeed():void

<<Java Class>>
Enemy1
object
- Enemy1(ObjectHandler)
- tick():void
- draw(GraphicsContext):void
- collision():void
- checkShow():void
- setSpeed():void
- getZ():int

<<Java Class>>
Enemy3
object
- totalSpeed: int
- Enemy3(ObjectHandler)
- tick():void
- draw(GraphicsContext):void
- collision():void
- getZ():int
- setSpeed():void
- getTotalSpeed():int
- setTotalSpeed(int):void

<<Java Class>>
Boss
object
- timerStart: boolean
- ultimate: boolean
- gunTimer: int
- Boss(ObjectHandler)
- tick():void
- collision():void
- shooting():void
- draw(GraphicsContext):void
- setSpeed():void
- getZ():int

<<Java Class>>
BulletObject
object
- damage: int
- BulletObject(double,double,ID,ObjectHandler,int,int)
- getDamage():int
- setDamage(int):void
- tick():void
- draw(GraphicsContext):void
- getZ():int
- checkShow():void

<<Java Class>>
SupplyObject
object
- collision():void
- tick():void
- SupplyObject(double,double,ID,ObjectHandler)
- checkShow():void

<<Java Class>>
PauseScreen
graphic
- PAUSE_FONT: Font
- PauseScreen()
- draw(GraphicsContext):void

<<Java Class>>
StartScreen
graphic
- primarystage: Stage
- canvas: Canvas
- gc: GraphicsContext
- menu: VBox
- StartScreen(Stage)
- draw(GraphicsContext):void
- startAnimation():void
- setupMenu():void

<<Java Class>>
EndScreen
graphic
- score: int
- primarystage: Stage
- gc: GraphicsContext
- canvas: Canvas
- isWin: boolean
- EndScreen(Stage,boolean)
- draw(GraphicsContext):void
- startAnimation():void

<<Java Class>>
GameScreen
graphic
- primarystage: Stage
- canvas: Canvas
- gc: GraphicsContext
- root: Pane
- timer: AnimationTimer
- hud: GameHud
- handler: ObjectHandler
- stage: int
- stageTime: int
- bossSpawn: boolean
- boss: Boss
- player: Player
- keyDown: boolean[]
- pause: boolean
- GameScreen(Stage)
- draw(GraphicsContext):void
- setKeyEvent(Scene):void
- spawn():void
- updateHud():void
- nextStage():void
- startAnimation():void
- isGameOver():void
- haveBossspawn():boolean
- getPlayer():Player
- getHud():GameHud

<<Java Interface>>
Screen
graphic
- WIDTH: int
- HEIGHT: int
- MAIN_FONT: Font
- HEADER_FONT: Font
- SELECT_PLAYER: Font
- draw(GraphicsContext):void
- startAnimation():void

<<Java Class>>
BossBullet
object
- state: int
- BossBullet(double,double,int,ObjectHandler,int)
- tick():void
- draw(GraphicsContext):void
- getZ():int
- getHit(GameObject):void
- setVel():void
- checkShow():void

<<Java Class>>
Bullet
object
- Bullet(double,double,int,int,ID,int,ObjectHandler)
- tick():void
- draw(GraphicsContext):void
- getZ():int
- getHit(GameObject):void
- checkShow():void

<<Java Class>>
LaserBeam
object
- boss: Boss
- timer: int
- LaserBeam(Boss,ObjectHandler)
- tick():void
- draw(GraphicsContext):void
- getZ():int
- getHit(GameObject):void
- checkShow():void

5. Class Details – Fields – Constructor – Methods

5.1. Package application

5.1.1 Class Main extends Application

5.1.1.1 Method

+ void main(Stirng[] args)	Main application
+ void start (Stage primarystage)	Set stage component

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5.2 Package exception

5.2.1 Class BarrirerOnException extend Exception

5.2.1.1 method

+ String getMessage()	Return string "The player already has a barrier"

5.2.2 Class MaxHealthException extend Exception

5.2.2.1 Method

+ String getMessage()	Return string "The player is already at max health"

5.2.3 Class NullSelectPlayer extend Exception

5.2.3.1 Method

+ String getMessage()	Return string "No character is selected"

5.3 Package graphic

5.3.1 Class AudioLoader

5.3.1.1 Field

+ AudioClip <u>MEGA_LASER</u>	Sound for Boss's laser beam
+ AudioClip <u>BUTTON_CLICK</u>	Sound for clicking button
+ AudioClip <u>COLLECT_SUPPLY</u>	Sound for collecting supply
+ AudioClip <u>DIED</u>	Sound for game over screen
+ AudioClip <u>ERROR</u>	Sound for error
+ AudioClip <u>NEXT_STAGE</u>	Sound for changing stage
+ AudioClip <u>CONGRAT</u>	Sound for winner screen
+ Song <u>START_SONG</u>	Background song for start screen
+ Song <u>NORMAL_SONG</u>	Background song for game normal screen
+ Song <u>BOSS_SONG</u>	Background song for boss screen

5.3.2 Class EndScreen implement Screen

5.3.2.1 Field

- int score	Score for game
- Stage primarystage	Main stage of program
- GraphicsContext gc	Graphics context for canvas
- Canvas canvas	Canvas for this screen
- boolean isWin	Boolean for checking is win or lose

5.3.2.2 Constructor

+ EndScreen(Stage primarystage, boolean)	Initialize the Endscreen field
	
	   - set canvas width ,height to WIDTH,HEIGHT
	
	  -get score form GameHud

5.3.2.3 Method

+ void draw(GraphicContext gc)	Draw the EndScreen depend on isWin
	If isWin true , the title "WINNER" and image WINNER_CUP.
	If isWin false , the title "GAME OVER!" and image BOOM.
	Following by the score parameter and text "Press Enter" for going to StartScreen.
+ void startAnimation()	Call method draw(gc)

5.3.3 Class GameHud

5.3.3.1 Field

- int stage	Level of game
- int score	Player's score
- int Player player	Player
+ Font HUD_FONT	Font for GameHud

5.3.3.2 Constructor

+ GameHud(Player player)	Initialize the Endscreen field
	Stage to 0 , Score to 1

5.3.3.3 Method

+ void draw(GraphicsContext gc)	Draw HP , Score and Stage for this player
+ void addScore(int score)	Add score
+ int getScore(int score)	
+ void setStage(int stage)	

5.3.4 Class GameScreen implement Screen

5.3.4.1 Field

- Stage Primarystage	Main stage of program
- Canvas canvas	Canvas for this screen
- GraphicsContext gc	Graphics context for canvas
- Pane root	Root for this screen
- Animationtimer timer	Timer for game
- GameHud hud	GameHud for showing HP, Score and stage
- ObjectHandler handler	ObjectHandler for this screen
- int stage	Level of game
- int stageTime	Time for stage
- boolean bossSpawn	Status for Boss
- Boss boss	Boss for game
- Player player	Player
- boolean[] keyDown	Status of control key
- boolean pause	Status of game

5.3.4.2 Constructor

+ GameScreen(Stage Primarystage)	Initialize the GameScreen field With Canvas and root (width , Height) = (WIDTH , HEIGHT)

5.3.4.3 Method

+ void draw(GraphicContext gc)	Draw GameScreen Background is ImageLoader.GAME_SCREEN
+ void setKeyEvent(Scene scene)	Handle control key W is move up , A is move left , S is move down , D is move right , ESCPAE is pause game and SPACE is continue game

+ void spawn()	Spawn enemy rate spawn depend on stage
+ void updateHud()	Update HP, Score and Stage
+ void nextStage()	Calculate time for changing stage
+ void startAnimation()	Play AudioLoader.NORMAL_SONG and call method draw(gc)
+ void isGameOver()	Checking for status of the game and choose the end screen
+ boolean haveBossspawn()	Return bossSpawn status
+ Player getPlayer()	
+ GameHud getHud()	

5.3.5 Class ImageLoader

5.3.5.1 Field

+ Image GAME_SCREEN	Background for game screen
+ Image BOOM	Image for game over scene
+ Image START_SCREEN	Background for start screen
+ Image PLAYER1	Image for player1 in selected screen
+ Image PLAYER2	Image for player2 in selected screen
+ Image INGAME_PLAYER1	Image for player1 in game screen
+ Image INGAME_PLAYER2	Image for player2 in game screen
+ Image BOSS_CHARGING	Image for boss charging laser beam
+ Image BOSS	Image for boss
+ Image BOSS_NORMAL_BULLET	Image for boss normal bullet
+ Image BOSS_LASERBEAM	Image for boss mega laser beam
+ Image PLAYR_LASER2	Image for laser of player
+ Image PLAYER_LASER	Image for player's laser
+ Image ENEMY1	Image for enemy1
+ Image ENEMY2	Image for enemy2

+ Image ENEMY3	Image for enemy3
+ Image BARRIER	Image for barrier
+ Image BARRIER_ICON	Image for barrier icon
+ Image GREEN_AMMUNITION_ICON	Image for ammunition
+ Image BLUE_AMMUNITION_ICON	Image for ammunition
+ Image HEALTH_ICON	Image for health icon
+ Image WINNER_CUP	Image for winner scene

5.3.6 Class PauseScreen

5.3.6.1 Field

+ Font PAUSE_FONT	Font for pause screen

5.3.6.2 Method

+ void draw()	Stop game and draw pause screen

5.3.7 Interface Screen

5.3.7.1 Field

+ int WIDTH	Width for screen to 800
+ int HEIGHT	Height for every screen to 600
+ Font MAIN_FONT	Font for start and end screen
+ Font HEADER_FONT	Font for header of screen
+ Font SELECT_PLAYER	Font for select player screen

5.3.7.2 Method

+ abstract void draw(GraphicsConntext gc)	Draw screen
+ abstract void startAnimation()	Start to run animation

5.3.8 Class SelectPlayerScreen implement Screen

5.3.8.1 Field

- Button player1	Button for choosing player1
- Button player2	Button for choosing player2
- Button playButton	Button for playing game
- GraphicsContext gc	Graphics Context for canvas
- Canvas canvas	Canvas for draw
- HBox player	Pane for collect player Button
- HBox start	Pane for collect playtButton
- String selectedPlayer	String for contain selected Player

5.3.8.2 Constructor

+ SelectPlayerScreen(Stage primarystage)	Initialize the Endscreen field
	
	  - set canvas width ,height to
	WIDTH,HEIGHT
	  - set selectedPlayer to " "
	  - call method setupbutton();

5.3.8.3 Method

+ void draw(GraphicsContext gc)	Draw screen with player1 player2 and play buttons and add image
+ void startAnimation()	Start animation by call draw(gc)
+ void setupButton()	Initialize every button Set event for clicking each button player1 button set selectedPlayer to "Player1" player2 button set selectedPlayer to "Player2" playButton start game

	Throw NullselectPlayerException if selectedPlayer is " "
+ void string getSelectedPlayer()	

5.3.9 Class Song

5.3.9.1 Field

+ boolean isplaying	Checking status of song
- int music	Number of song
- String url	String for path of music

5.3.9.2 Constructor

+ Song(int music)	Set song background by music

5.3.9.3 Method

+ void playSong()	Start playing song
+ void stopSong()	Stop song

5.3.10 Class StartScreen

5.3.10.1 Field

- Stage primarystage	Main stage of the program
- Canvas canvas	Canvas for start screen
- GraphicsContext gc	Graphics Context for canvas
- VBox menu	Pane for menu

5.3.10.2 Constructor

+ StartScreen(Stage primarystage)	Initialize the StartScreen field Call method setupMenu()

5.3.10.3 Method

+ void draw(GraphicsContext gc)	- Draw start screen - Background START_SCREEN

	- Game name "DPA SHOOTER" - Song <u>START_SONG</u>
+ void startAnimation()	Start animation by calling draw(gc) method
+ void setupMenu()	- Initialize start and exit button - Color black for button - Font MAIN_FONT ,Color white - Sound for clicking button BUTTON_CLICK - add event for each button start button go to SelectPlayerScreen exit button for exit game

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5.4 package object

5.4.1 Class GameObject(Abstract)

5.4.1.1 Field

# double x	Position of the object on X-Axis
# double y	Position of the object on Y-Axis
# double velX	Velocity of the object on X-Axis
# double velY	Velocity of the object on Y-Axis
# int width	Width of the object
# int height	Height of the object
# ID id	The type of the object
# int limitX	The limit position on X-Axis before the object was stopped or deleted
# int limitY	The limit position on Y-Axis before the object was stopped or deleted
# ObjectHandler handler	Handler of the object

# Boolean isShow	Object is show or not
# int score	Bounty score of the object
# Random random	Random the number

5.4.1.2 Constructor

+ Boss(double x, double y, ID id, ObjectHandler handler, int width , int height)	Set value of the object's corresponding field and set isShow to true

5.4.1.3 Methods

+ void tick()	/*Abstract Class*/
+ void draw(GraphicsContext gc)	/*Abstract Class*/
+ int getZ()	/*Abstract Class*/
+ Shape getBounds()	Return its hit box
+ void getHit(Gameobject object)	/*Abstract Class*/
+ checkShow()	/*Abstract Class*/
Getter and Setter for X	
Getter and Setter for Y	
Getter and Setter for VelX	
Getter and Setter for VelY	
Getter for ID	
Getter and Setter for isShow	
Getter and Setter for score	
Getter and Setter for width	
Getter and Setter for height	

5.4.2 Class BattleshipObject(Abstract) extends GameObject implements Damagable

5.4.2.1 Field

# int damage	Damage of the object
# int hp	Health of the object

5.4.2.2 Constructor

+ public BattleshipObject (double x, double y, ID id, ObjectHandler handler int width, int height)	Set value of the object's corresponding field

5.4.2.3 Method

+ void collision()	/*Abstract Class*/
+ void getHit(GameObject object)	Reduce hp by objects damage if the object is Damagable.
+ void cos()	Calculate cos value of the angle of the distance between alien and player
+ void sin()	Calculate sin value of the angle of the distance between alien and player
+ void checkShow()	Check is it hp is more than 0 if not set isShow to false.
Getter and Setter for damage	
Getter and Setter for hp	

5.4.3 Interface: Damagable

5.4.3.1 Methods

Getter and setter for Damage	

5.4.4 Class Enemy1 extends BattleshipObject

5.4.4.1 Constructor

+ Enemy1(handler)	Random position x,y Set ID to ID.Enemy , width and height to 50, limitX to 800, limitY to 700, damage to 1, score to 1,hp to 1 Call setSpeed() Add this Object to handler

5.4.4.2 Method

+ void tick()	Update its current position Call checkShow() and collision()
+ void draw(GraphicsContext gc)	Draw its image on its current position
+ void collision()	Check if it is hitbox intersect with other hitbox with ID.player If intersected called getHit() for both object.
+ void checkShow()	Check is it current position out of limit position or its hp is less than 0 if yes set its isShow to false.
+ void setSpeed()	Random its velX,velY
+ int getZ()	Return its priority in handler

5.4.5 Class Enemy2 extends BattleshipObject

5.4.5.1 Field

- int gunTimer	Timer for shooting bullet

5.4.5.2 Constructor

+ Enemy2(handler)	Random position x,y Set ID to enemy , width and height to 50, limitX to 800, limitY to 100, damage to 1, score to 1,hp to 1 Call setSpeed()

	Add this Object to handler

5.4.5.3 Method

+ void tick()	Update its current position
	Call setSpeed(),shooting(),checkShow() and
	collision()
	Increase gunTimer
+ void draw(GraphicsContext gc)	Draw its image on its current position
+ void collision()	Check if it is hitbox intersect
	with other hitbox with ID.Player
	If intersected called getHit() for both object.
+ void shooting()	Initialize bullet by checking gunTImer
+ void setSpeed()	Update its velocity by checking its current
	position with limitX and limitY
+ int getZ()	Return its priority in handler

5.4.6 Class Enemy3 extends BattleshipObject

5.4.6.1 Field

+ int totalSpeed	Its total speed

5.4.6.2 Constructor

+ Enemy3(handler)	Random position x,y
	Set ID to ID.Enemy,width and height to 50,
	limitX to 800, limitY to 700, damage to 1,
	score to 50, hp to 2 and totalSpeed to 4
	Add this object to handler

5.4.6.3 Method

+ void tick()	Update its current position
	Call setSpeed(),checkShow() and collision()

+ void draw(GraphicsContext gc)	Draw its image on its current position
+ void collision()	Check if its hitbox intersect with other hitbox with ID.Player, If intersected called getHit() for both object.
+ void setSpeed()	Update its velocity using cos(),sin() and totalSpeed to find the velocity to the player
+ int getZ()	Return its priority in handler
Getter and Setter for totalSpeed	

5.4.7 Class Player extends BattleshipObject

5.4.7.1 Field

- boolaen isBarrier	Check is barrier is on
- int shootingMode	Determine the mode of the shooting which will intialize the bullet
- int modeTimer	Timer for special shooting mode
- int gunTimer	Timer for shooting bullet
- Image currentImage	Current Image of the player

5.4.7.2 Constructor

+ Player(ObjectHandler handler)	Set postion x,y to the center Set Id to ID.Player, width and height to 70, damage to 1, hp to 10,barrierOn to false,velX and velY to 0,limitX to 800 and limitY to 600 Add this object to handler

5.4.7.3 Methods

+ void tick()	Update its current position Call checkShow(), collision() and shooting() Increase gunTimer
+ void collosion()	Check if its hitbox intersect

	with other hitbox with ID.Enemy ,
	If intersected called getHit() for both object.
+ void getHit(Gameobject object)	Reduce hp by object's damage if the object is Damagable.
	If barrier is on, turn barrier off first.
+ void getHealth(int health)	Increase hp by health
	Hp won't be more than 15.
	If HP already 15 throw MaxHealthException()
+ void draw(GraphicsContext gc)	Draw its image on its current position
+ void shooting()	Determine the mode of spawning bullet by shootingMode and initialize bullet by checking gunTImer.
+ int getZ()	Return its priority in handler
+ void setPlayer(String player)	Set the currentImage
+ Shape getBounds()	Return the first hitbox
+ Shape getBounds2()	Return the second hitbox
+ void setMode(int mode)	Set mode and set modeTimer to 0
+ void setBarrier(Boolean on)	If barrier already true and on is true throw BarrierOnException
Getter isBarrier	

5.4.8 Class Boss extends BattleshipObject

5.4.8.1 Field

- boolean timerStart	Check is boss is in the correct position to start gunTimer
- boolean ultimate	Check is boss is shooting its ultimate
- Int gunTimer	Timer for shooting bullet

5.4.8.2 Constructor

+ Boss(ObjectHandler handler)	Set position x,y,id to ID.Boss, width to 400, height to 100, damage to 2, score to 10000, hp to 300, limitX to 800 and limitY to 0 Call setSpeed(); Add this object to handler

5.4.8.3 Method

+ void tick()	Update its current position Call checkShow(), collision() ,shooting() and setSpeed() Increase gunTimer
+ void collision()	Check if its hitbox intersect with other hitbox with ID.Player, If intersected called getHit() for both object.
+ void shooting()	Initialize BossBullet by checking gunTImer and ultimate Intialize LaserBeam by checking gunTimer
+ void draw(GraphicsContext gc)	Draw its image on its current position
+ void setSpeed()	Update its velocity
+ void getZ()	Return its priority in handler

5.4.9 Class BulletObject (Abstract) extends GameObject implements Damagable

5.4.9.1 Field

- int damage	The bullet's damage

5.4.9.2 Constructor

+ BulletObject(double x,double y,ID id, ObjectHandler handler,int width,int height)	Set value of the object's corresponding field

5.4.9.3 Method

+ void tick()	/*Abstract Class*/
+ void draw(GraphicContext gc)	/*Abstract Class*/
+ int getZ()	/*Abstract Class*/
+ void checkShow()	/*Abstract Class*/
Getter and setter for damage	

5.4.10 Class Bullet extends BulletObject

5.4.10.1 Constructor

+ Bullet(double x,double y,int velX,int velY ,ID id, ObjectHandler handler,int width,int height)	Set value of the object's corresponding field Set limitX to 900, limitY to 700 Add this object to handler

5.4.10.2 Method

+ void tick()	Update its current position Call checkShow()
+ void draw(GraphicsContext gc)	Draw its image on its current position Determine the image by checking id and damage
+ int getZ()	Return its priority in handler
+ void getHit(GameObject object)	Set isShow to false
+ void checkShow()	Check its position, if its position isn't in the limit position setShow it to false

5.4.11 Class BossBullet extends BulletObject

5.4.11.1 Field

- int state	Determine the velocity of the bullet

5.4.11.2 Constructor

+ BossBullet(double x,double y,int damage,Obejct Handler,int state)	Set value of the object's corresponding field Set limitX to 900,limitY to 700, set width and height to 20 Call setVel() Add this object to handler

5.4.11.3 Method

+ void tick()	Update its current position Call checkShow()
+ void draw(GraphicsContext gc)	Draw its image on its current position
+ void getZ()	Return its priority in handler
+ void getHit(GameObject object)	Set isShow to false
+ void setVel()	Set velX and velY by checking state
+ void checkShow()	Check is it current position out of limit position, if yes set isShow false

5.4.12 Class LaserBeam extends BulletObject

5.4.12.1 Field

- Boss boss	The Boss which fire LaserBeam
- int timer	Timer for duration of LaserBeam

5.4.12.2 Constructor

+ LaserBeam(Boss boss,Object handler)	Random position Set value of the object's corresponding field Set id to ID.Boss, set width to 100, set height to 700, set damage, set timer to 0, limitX to 700, limitY to 900

	Add this object to handler

5.4.12.3 Method

+ void tick()	Update position by referencing the position of the boss
	Call checkShow()
	Increase timer by 1
+ void draw(GraphicsContext gc)	Draw its image on its current position
+ int getZ()	Return its priority in handler
+ void getHit()	Call checkShow
+ void checkShow()	Check is timer is more than a duration, if yes set isShow false

5.4.13 Class SupplyObject(Abstract) extends GameObject

5.4.13.1 Constructor

SupplyObject(double x, double y, ID id, ObejctHandler handler)	Set value of the object's corresponding field
	Set velX to 0, velY to 2, limitX to 800, limitY to 700

5.4.13.2 Method

+ void collision()	/*Abstract Class*/

5.4.13.3 Method

+ void tick()	Update its position
	Call checkShow(),collision()
+ void checkShow()	Check is it current position out of limit position, if yes set isShow false

5.4.14 Class SupplyBarrier extends SupplyObject

5.4.14.1 Constructor

+ SupplyBarrier(ObjectHandler handler)	Random position
	Set Id to ID.Supply
	Add this object to handler

5.4.14.2 Method

+ void draw(GraphicsContext gc)	Draw its image on its current position
+ void collosion()	Check if its hitbox intersects with others hitbox with player class, If intersected set barrier of the player to true and called getHit
+ int getZ()	Return its priority in handler
+ void getHit(GameObject gameObject)	Set isShow to false

5.4.15 Class SupplyBullet extends SupplyObject

5.4.15.1 Field

- int mode	The type of the SupplyBullet

5.4.15.2 Constructor

+ SupplyBullet(ObjectHandler handler)	Random position and mode
	Set Id to ID.Supply
	Add this object to handler

5.4.15.3 Method

+ void draw(GraphicsContext gc)	Draw its image on its current position
+ void collosion()	Check if its hitbox intersects with others hitbox with player class,

	If intersected set mode of the player to this object mode and called getHit
+ int getZ()	Return its priority in handler
+ void getHit(GameObject object)	Set isShow to false

5.4.16 Class SupplyHealth extends SupplyObject

5.4.16.1 Constructor

+ SupplyBullet(ObjectHandler handler)	Random position Set Id to ID.Supply Add this object to handler

5.4.16.2 Method

+ void draw(GraphicsContext gc)	Draw its image on its current position
+ void collosion()	Check if its hitbox intersects with others hitbox with player class, If intersected called getHealth(1) of the player and called getHit
+ int getZ()	Return its priority in handler
+ void getHit(GameObject object)	Set isShow to false

5.4.17 Class ObjectHandler

5.4.17.1 Field

- List<GameObject> objects	List of all object that show in the game
- Comparator<GameObject> comparator	The comparator for the priority of handler

5.4.17.2 Method

+ ObjectHandler()	Initialize objects and compartor

5.4.17.3 Method

+ void tick()	Call tick of all object in the objects
+ void draw()	Call draw of all object in the objects
+ void removeNotShow()	Remove the object which is not show in the objects
+ void addObject(Gameobject object)	Add object to the objects and sort it
+ void removeObject(GameObject object)	Remove the object from the objects
Getter for objects	

5.4.18 Enum ID

5.4.18.1 Field

+ ID Player	The player
+ ID Enemy	The enemy
+ ID Boss	The boss
+ ID Supply	The supply