

Rakajarn Documentation

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2110215 Programming Methodology

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ProgMethWars

Introduction

Prog Meth wars is inspired by an eponymous film name “Star Wars”. The objective of the game is to destroy the droids to reach more levels. Finish the lv.5 to win the game.

Rules

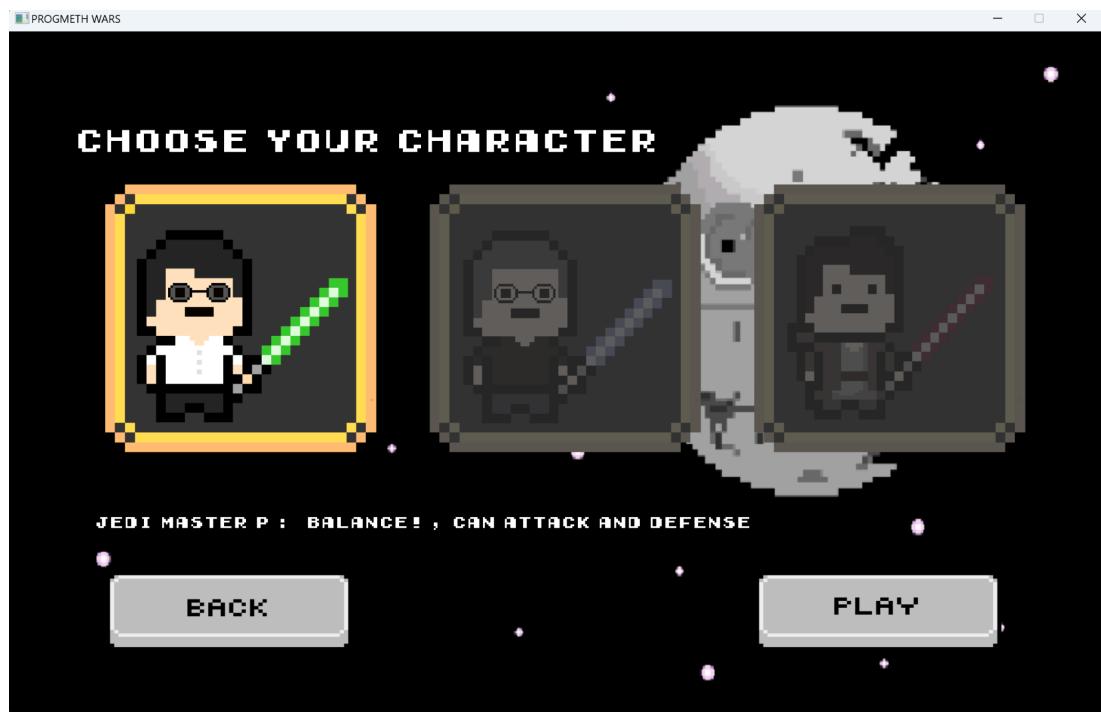
There Are 3 different characters to play. Press WASD to move around the map, and LEFT CLICK to attack. Destroy the droids to level up. Do not close to the burning area. This may hurt you. There are item crates generated on the map, and 3 types of item that will help you. Reach lv.5 to face a Big Guy, and win the game.

Example

- Menu Scene



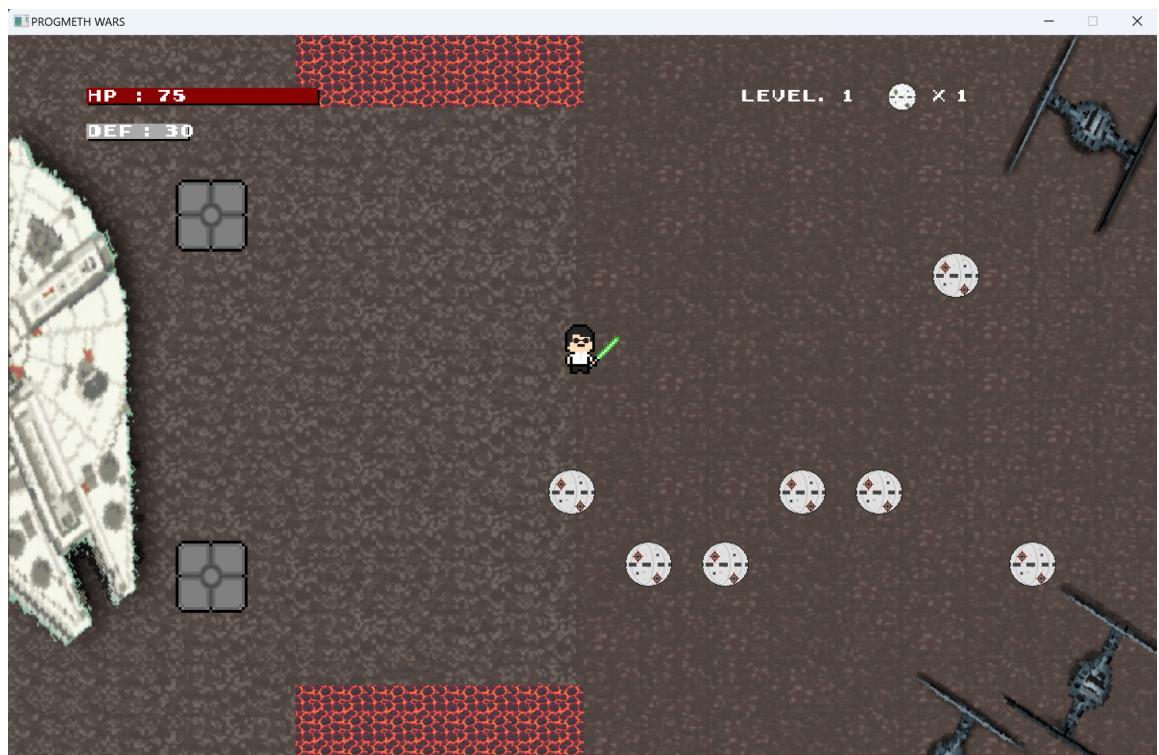
- Choose PLayer Scene



- Help Scene



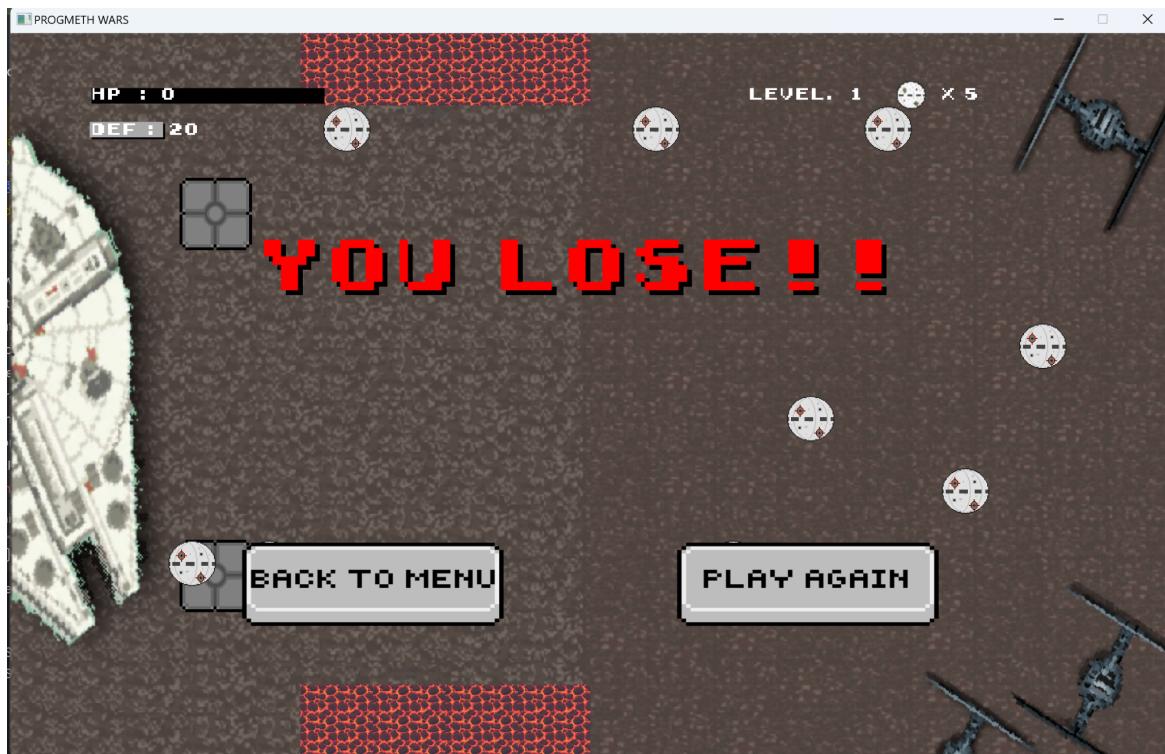
- Game Scene



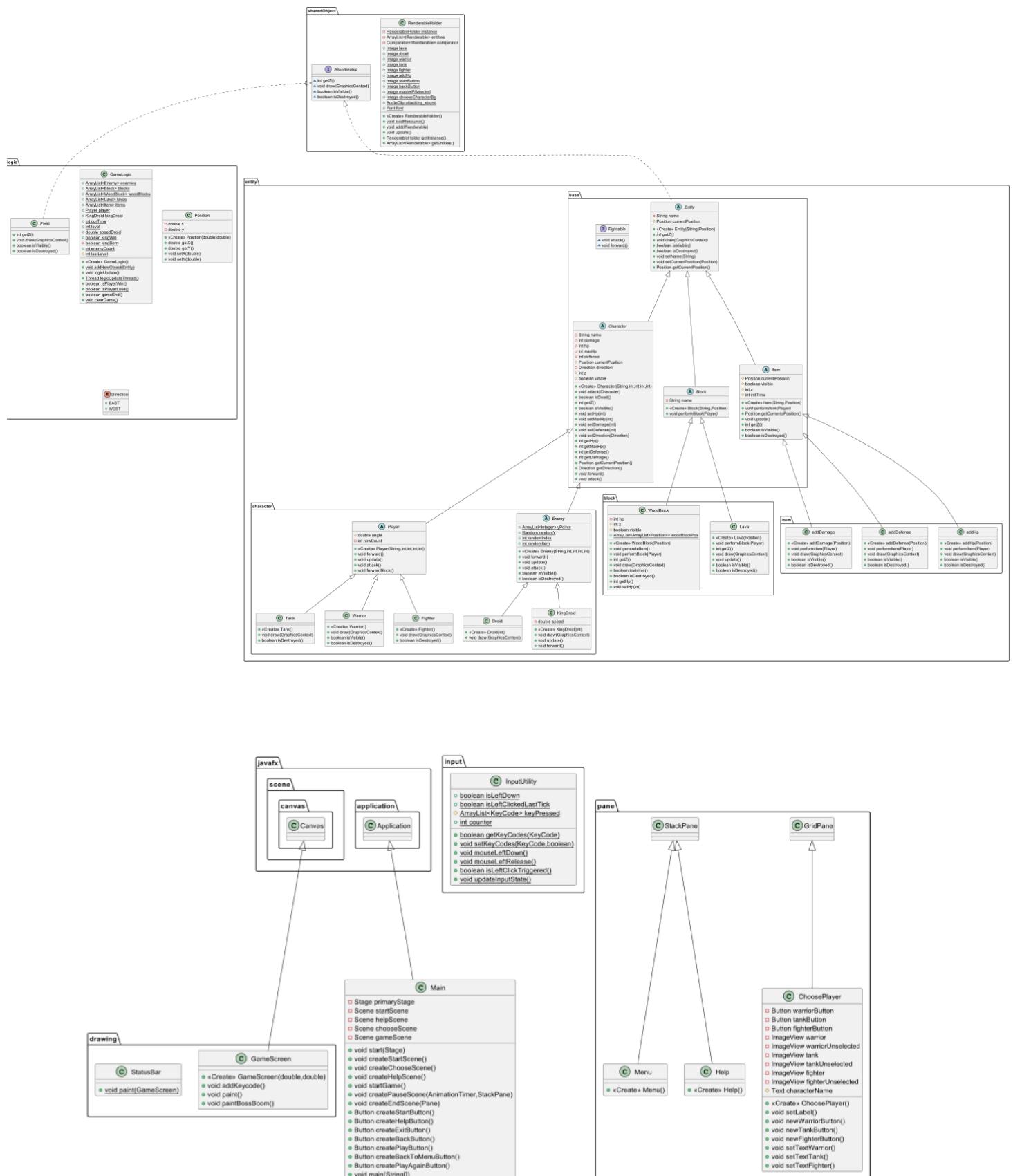
- When you click Esc you can go back to the menu scene



- When the game ends you can choose to start a new game or go back to the menu scene.



- UML Diagram



1.Package drawing

1.1 Class GameScreen extends Canvas

1.1.1 Constructor

+ GameScreen(double width, double height)	Initialize new GameScreen
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1.1.2 Methods

+ void addKeyCode()	Handling user input
+ void paint()	Draw every entity in this game if it is visible.
+ void paintBossBoom()	Draw Boss Boom

1.2 Class StatusBar

1.2.1 Methods

+ void paint(GameScreen gameScreen)	Create status bar
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2.Package entity

2.1 Package entity.base

2.1.1 Abstract Class Entity implements IRenderable

2.1.1.1 Fields & Constructor

- String name	Name of entity
+ Entity(String name, Position pos)	Initialize new entity

2.1.1.2 Methods

+ int getZ()	Return z
+ void draw(GraphicsContext gc)	Draw entity picture

+ boolean isVisible()	Different true and false condition in different entity
+ boolean isDestroyed()	Different true and false condition in different entity
+ void setName(String name)	Setter of name
+ String getName()	Getter of name
+ void setCurrentPosition(Position currentPosition)	Setter of currentPosition
+ Position getCurrentPosition()	Getter of currentPosition

2.1.2 Abstract Class Block extends Entity

2.1.2.1 Constructor

+ Block(String name,Position pos)	Initialize new block
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2.1.2.2 Methods

+ void performBlock(Player player)	Action of block
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2.1.3 Abstract Class Character extends Entity

2.1.3.1 Fields & Constructor

- int damage	Damage of character
- int hp	Hp of character
- int maxHp	MaxHp of character
- int defense	Defense of character
- Direction direction	Direction of character

# int z	z of character
# boolean visible	Tell that this is visible or not
# boolean attacking	Tell that this is attacking or not
# boolean destroy	Tell that this is destroy or not
+ Character (String name, int damage, int hp, int maxHp, int defense)	Initialize new character with given parameter and <ul style="list-style-type: none"> - set direction to EAST - set z = 0 - set visible = true - set attacking = false

2.1.3.2 Methods

+ boolean isDead()	Return true if hp = 0
+ int getZ()	Getter of z
+ boolean isVisible()	Return visible, but if character is dead return false
+ boolean isDestroyed()	Return false
+ void setHp(int hp)	Set hp not less than 0 and not more than maxHp
+ void setMaxHp(int maxHp)	Set maxHp not less than 0
+ void setDamage(int damage)	Set damage not less than 0
+ void setDefense(int defense)	Set defense not less than 0
+ void setDirection(Direction direction)	Setter of direction
+ void forward()	Character movement
+ void attack()	Character attack
Getter of all private fields	-

2.1.4 Abstract Class Item extends Entity

2.1.4.1 Fields & Constructor

# boolean visible	Tell that this item is visible or not
# boolean active	Tell whether this item has performed its ability or not.
# int z	z of item
# int initTime	Time that item has been generated.
+ Item(String name,Position pos)	Initialize a new item with a given parameter and <ul style="list-style-type: none"> - set z = -10 - set active = false - set visible = true - set initTime = GameLogic.curTime

2.1.4.2 Methods

+ void performItem(Player player)	Action of item
+ void update()	Update item's status and call performItem if the player can collect it.
+int getZ()	Getter of z
+ boolean isVisible()	Return true if it is visible and not destroyed
+ boolean isDestroyed()	Return true if initTime + 2500 less or equal than GameLogic.curTime

2.1.5 Interface Fightable

+ void attack()	Different in each class Tell how this attack other
+ void forward()	Different in each class Tell how this move

2.2 Package entity.block

2.2.1 Class Lava extends Block

2.2.1.1 Constructor

+ Lava(Position pos)	Initialize new lava at given position
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2.2.1.2 Methods

+ void performBlock(Player player)	Reduce player's hp by 5
+ int getZ()	Return -9990
+ void draw(GraphicsContext gc)	Draw lava picture
+ void update()	Check if the player comes in the lava block. If it is, perform the lava block.
+ boolean isVisible()	Return true
+ boolean isDestroyed()	Return false

2.2.2 Class WoodBlock extends Block

2.2.2.1 Fields & Constructor

- int hp	Hp of wood block
# int z	z of wood block
# boolean visible	Tell that this wood block is visible or not.
+ ArrayList<ArrayList<Position>> woodBlockPos	ArrayList of ArrayList of two positions that the wood block can be generated.
+ WoodBlock(Position pos)	Initialize new wood block at given position and <ul style="list-style-type: none">- set hp = 1- set visible = true

2.2.2.2 Methods

+ void generateItem()	Initialize item in wood block
+ void performBlock(Player player)	- set visible = false
+ int getZ()	Return 0
+ boolean isVisible()	Return true if hp not equal 0.
+ boolean isDestroyed()	Return false
+ int getHp()	Getter of hp
+ void setHp(int hp)	Set hp not less than 0

2.3 Package entity.character

2.3.1 Abstract Class Enemy extends Character

2.3.1.1 Fields & Constructor

+ ArrayList<Integer> yPoints	ArrayList of y points that enemy can be initialized.
+ Random randomY	new Random()
+ int randomIndex	Random index number of yPoints
+ int randomItem	y at randomIndex in yPoints
+ Enemy(String name, int damage, int hp, int maxHp, int defense)	Initialize new enemy

2.3.1.2 Methods

+ void forward()	Enemy movement
+ void update()	- Update enemy's position including attack - Call forward() and attack()

+ void attack()	Enemy attack player
+ boolean isVisible()	Return true if enemy's hp not equal 0 and not be destroyed, otherwise return false.
+ boolean isDestroyed()	Return destroy

2.3.2 Class KingDroid extends Enemy

2.3.2.1 Fields & Constructor

- double speed	speed = 0.5
+ KingDroid(int y)	Initialize new KingDroid - set name = "KingDroid" - set damage = 25 - set hp = 100 - set maxHp = 100 - set defense = 100 - set current position = (1050,y) - set visible = true - set z = 1 -set destroy = false

2.3.2.2 Methods

+ void forward()	KingDroid movement
+ void update()	Update KingDroid's position including attack and add speed
+ void draw()	Draw KingDroid picture

2.3.3 Class Droid extends Enemy

2.3.3.1 Constructor

+ Droid(int y)	Initialize new Droid
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	<ul style="list-style-type: none"> - set name = "Droid" - set damage = 10 - set hp = 30 - set maxHp = 30 - set defense = 0 - set current position = (1050,y) - set visible = true - set z = 1 -set destroy = false
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2.3.3.2 Methods

+ void draw(GraphicsContext gc)	Draw Droid picture
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2.3.4 Abstract Class Player extends Character

2.3.4.1 Fields & Constructor

# double angle	Direction in angle at player's front
- int nowCount	<ul style="list-style-type: none"> - nowCount = 0 - count for mouse trigger
+ Player (String name, int damage, int hp, int maxHp, int defense)	<ul style="list-style-type: none"> Initialize player with given parameter and - set angle = 0 - z = 1000

2.3.4.2 Methods

+ void forward()	PLayer movement
+ void update()	Update player's position including attack
+ void attack()	Player attack enemy or wood block
+ void forwardBlock()	Player movement with collide with wood block

2.3.5 Class Warrior extends Player

2.3.5.1 Constructor

+ Warrior()	Initialize new Warrior - set name = "Warrior" - set damage = 10 - set hp = 75 - set maxHp = 75 - set defense = 40 - set current position = (500,250) - set angle = 0
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2.3.5.2 Methods

+ void draw(GraphicsContext gc)	Draw Warrior picture
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2.3.6 Class Tank extends Player

2.3.6.1 Constructor

+ Tank()	Initialize new Tank - set name = "Tank" - set damage = 12 - set hp = 120 - set maxHp = 120 - set defense = 70 - set current position = (500,250) - set angle = 0
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2.3.6.2 Methods

+ void draw(GraphicsContext gc)	Draw Tank picture
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2.3.7 Class Fighter extends Player

2.3.7.1 Constructor

+ Fighter()	Initialize new Fighter - set name = "Fighter" - set damage = 25 - set hp = 50 - set maxHp = 50 - set defense = 35 - set current position = (500,250) - set angle = 0
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2.3.7.2 Methods

+ void draw(GraphicsContext gc)	Draw Fighter picture
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2.4 Package entity.item

2.4.1 Class addDamage extends Item

2.4.1.1 Constructor

+ addDamage(Position pos)	Initialize addDamage item at given position
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2.4.1.2 Methods

+ void performItem(Player player)	add 15% of player's damage
+ void draw()	Draw addDamage picture

2.4.2 Class addDefense extends Item

2.4.2.1 Constructor

+ addDefense(Position pos)	Initialize addDefense item at given position
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2.4.2.2 Methods

+ void performItem(Player player)	add 25% of player's defense
+ void draw()	Draw addDefense picture

2.4.3 Class addHP extends Item

2.4.3.1 Constructor

+ addHP(Position pos)	Initialize addHP item at given position
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2.4.3.2 Methods

+ void performItem(Player player)	add 25% of player's hp
+ void draw()	Draw addHp picture

3.Package input

3.1 class InputUtility

3.1.1 Fields

+ boolean <u>isLeftDown</u>	isLeftDown = false
+ boolean <u>isLeftClickedLastTick</u>	isLeftClickedLastTick = false
+ ArrayList<KeyCode> <u>keyPressed</u>	ArrayList that collect key code
+ int <u>counter</u>	counter = 0

3.1.2 Methods

+boolean <u>getKeyCodes(KeyCode keyCode)</u>	Return true if keyPressed contains keyCode
+ void <u>setKeyCodes(KeyCode keyCode, boolean pressed)</u>	If keyCode is pressed add it to keyPress , otherwise remove it from keyPress.
+ void <u>mouseLeftDown()</u>	When mouse left is clicked set isLeftDown = true and isLeftClickedLastTick = true.

<u>+ void mouseLeftRelease()</u>	Set isLeftDown = false
<u>+ boolean isLeftClickTriggered()</u>	Return isLeftClickedLastTick
<u>+ void updateInputState()</u>	Set isLeftClickedLastTick = false

4.Package logic

4.1 Enum Direction

4.1.1 Enum

EAST, WEST

4.2 Class Field implements IRenderable

4.2.1 Methods

<u>+ int getZ()</u>	Return -9999
<u>+ void draw()</u>	Draw field picture
<u>+ boolean isVisible()</u>	Return true
<u>+ boolean isDestroyed()</u>	Return false

4.3 Class GameLogic

4.3.1 Fields & Constructor

<u>- ArrayList<Entity> gameObject</u>	ArrayList of all entities
<u>+ ArrayList<Enemy> enemies</u>	ArrayList of all enemies
<u>+ ArrayList<Block> blocks</u>	ArrayList of all blocks
<u>+ ArrayList<WoodBlock> woodBlocks</u>	ArrayList of all wood blocks
<u>+ ArrayList<Lava> lavas</u>	ArrayList of all lavas
<u>+ ArrayList<Item> items</u>	ArrayList of all items
<u>+ Player player</u>	Player of this game

<u>+ int curTime</u>	Count every frame of animationtimer
<u>+ double speedDroid</u>	Droid's speed = 0.8
<u>+ double speedPlayer</u>	Player's speed = 2
<u>- boolean kingBorn</u>	- Make the game know that the king droid was initialized.
<u>+ int enemyCount</u>	Count the number of enemies that were killed by the player.
<u># int lastLevel</u>	Last level of player
<u>+ boolean kingWin</u>	kingWin = false
<u>+ GameLogic()</u>	<ul style="list-style-type: none"> - Initialize all ArrayList - Set kingBorn = false - Set kingWin = false - Initialize Field - Set enemyCount = 0 - Set lastLevel = 1 - Set curTime = 0 - Initialize wood block and lava

4.3.2 Methods

<u>+ void addNewObject(Entity entity)</u>	Add new entity to it's ArrayList and entities in RenderableHolder
<u>+ void logicUpdate()</u>	<ul style="list-style-type: none"> - Initialize enemies - Call update() for all entities
<u>+ Thread logicUpdateThread()</u>	Thread that update logic
<u>+ boolean isPlayerWin()</u>	Return true if the king droid was born and was dead.
<u>+ boolean isPlayerLose()</u>	Return true if player's hp = 0
<u>+ boolean gameEnd()</u>	Return true if the player wins or loses.

+ void clearGame()	Reset all fields when game end, also entities in RenderableHolder
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4.4 Position

4.4.1 Fields & Constructor

- double x	Value of x point
- double y	Value of y point
+ Position(double x, double y)	Initialize new position with given parameter

4.4.2 Methods

+ void setX(double x)	Set x not less than 5 and not more than 1125.
+ void setY(double y)	Set x not less than 0 and not more than 675.
Getter of all fields	-

5.Package sharedObject

5.1 Interface IRenderable

+ int getZ()	Return z value
+ void draw(GraphicsContext gc)	Draw picture
+ boolean isVisible()	Different true and false condition in different entity
+ boolean isDestroyed()	Different true and false condition in different entity

5.2 Class RenderableHolder

5.2.1 Fields & Constructor

<u>- RenderableHolder instance</u>	Initialize new RenderableHolder
<u>- ArrayList<IRenderable> entities</u>	ArrayList of all entities
<u>- Comparator<IRenderable> comparator</u>	Comparator that use in entities to sort drawing order
<u>+ RenderableHolder()</u>	Initialize entities and comparator
<u>+ Image grass</u>	grass picture
<u>+ Image lava</u>	lava picture
<u>+ Image wood</u>	wood picture
<u>+ Image droid,, kingDroid1, kingDroid2</u>	droid and king droid picture
<u>+ Image warrior,warrior2,warriorHit,warriorHit2,warriorUnselected</u>	All of Warrior picture
<u>+ Image tank,tank2,tankHit,tankHit2,tankUnselected</u>	All of Tank picture
<u>+ Image fighter,fighter2,fighterHit,fighterHit2,fighterUnselected</u>	All of Fighter picture
<u>+ Image addHp,addDef,addDmg</u>	Each item picture
<u>+ Image startButton,startButtonPressed</u>	Start Button picture
<u>+ Image startScreen</u>	Background of start scene
<u>+ Image backButton,backButtonPressed</u>	Back Button picture
<u>+ Image exitButton,exitButtonPressed</u>	Exit Button picture
<u>+ Image helpButton,helpButtonPressed</u>	Help Button picture
<u>+Image playButton, playButtonPressed</u>	Play Button picture

<u>+ Image masterPSelected, masterPUnselected,</u> <u>masterToeSelected, masterToeUnselected,</u> <u>sithSelected, sithUnselected</u>	Picture of all type of player in choose player scene
<u>+ Image chooseCharacterBg, helpBox1,</u> <u>backToMenu1, backToMenu2, resume1, resume2,</u> <u>playAgain1, playAgain2</u>	- ChooseCharacter background - Back to menu button - Resume Button - Play again Button
<u>+ AudioClip attacking_sound,dead_sound,</u> <u>hurt_sound, button_sound,</u> <u>collect_sound,explode,intro,levelUp,jedi_playing</u>	Sound in this game
<u>+ Font font</u>	Font that use in this game

5.2.2 Methods

<u>+ void loadResource()</u>	Initialize remain fields which are resource and load all resource
<u>+ void add(IRenderable entity)</u>	Add entity to entities
<u>+ void update()</u>	If the entity is not visible, remove it from entities.
<u>+ RenderableHolder getInstance()</u>	Getter of instance
<u>+ ArrayList<IRenderable> getEntities()</u>	Getter of entities

6.Package pane

6.1 Class ChoosePlayer extends GridPane

6.1.1 Fields & Constructor

<u>- Button warriorButton</u>	Choose warrior button
<u>- Button tankButton</u>	Choose tank button
<u>- Button fighterButton</u>	Choose fighter button

- ImageView warrior	Image of warrior
- ImageView warriorUnselected	Image of warriorUnselected
- ImageView tank	Image of tank
- ImageView tankUnselected	Image of tankUnselected
- ImageView fighter	Image of fighter
- ImageView fighterUnselected	Image of fighterUnselected
- Text characterName	Text of characterName
+ ChoosePlayer()	Initialize choose player pane

6.1.2 Methods

+ void setLabel()	Set label on this pane
+ void newWarriorButton()	Create new warrior button
+ void newTankButton()	Create new tank button
+ void newFighterButton()	Create new fighter button
+ void setTextWarrior()	Set text explain warrior
+ void setTextTank()	Set text explain tank
+ void setTextFighter()	Set text explain fighter

6.2 Class Help extends StackPane

6.2.1 Constructor

+ Help()	Create new Help pane
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6.3 class Menu extends StackPane

6.3.1 Constructor

+ Menu()	Create new Menu pane
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7. Class Main extends Application

7.1.1 Fields & Constructor

- Stage primaryStage	Primary Stage
- Scene startScene	Start Scene
- Scene helpScene	Help Scene
- Scene chooseScene	Choose Scene
- Scene gameScene	Game Scene
+ void main(String[] args)	Start main

7.1.2 Methods

+ void start(Stage primaryStage)	Set primary stage
+ void createStartScene()	Create Start Scene
+ void createChooseScene()	Create Choose Scene
+ void startGame()	Start game
+ void createPauseScene(AnimationTimer animationTimer, StackPane stackPane)	Create pause scene
+ void createEndScene(Pane pane)	Create End Scene
+ Button createStartButton()	Create Start Button
+ Button createHelpButton()	Create Help Button
+ Button createExitButton()	Create Exit Button
+ Button createBackButton()	Create Back Button
+ Button createPlayButton()	Create Play Button

