Battleground – workshop

Overview

-In this workshop we shall create a console game application called "BATTLEGROUND".

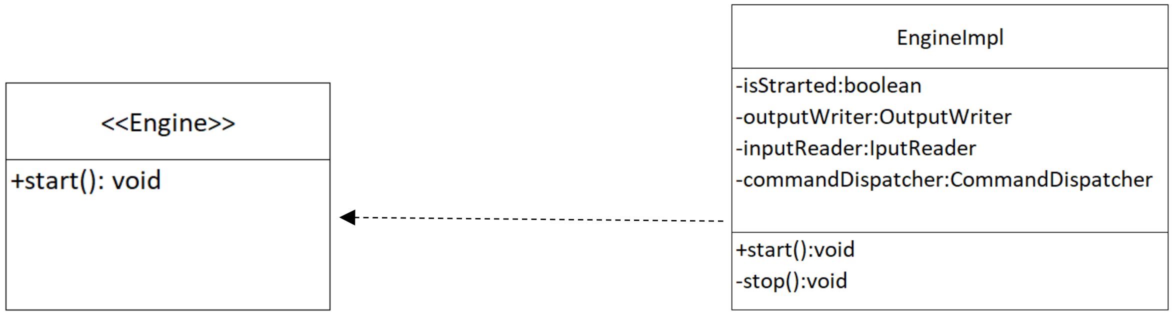
BattleGround size: 5x5.

UnitTypes: Marine and Carrier.

Commands

- spawn {unitType} {name} {coordinateX} {coordinateY}
  - add an unit in the battleground
- status {name}
  - give information about the unit in this name.
- move {name} {coordinateX} {coordinateY}
  - move the unit to a new position on the field.
- fight
  - every unit hits someone (if there are some whithin it's range). Their ranges are static final variables and are described in classes Marine and Carrier.
  - unit can hit only one opponent (within its range)
  - when an unit chooses the target he picks one with lower health points. If on battleground have more than one unit with same lower points he compare them by name.
- game-over
  - the game is over and you should print "Game Over!"

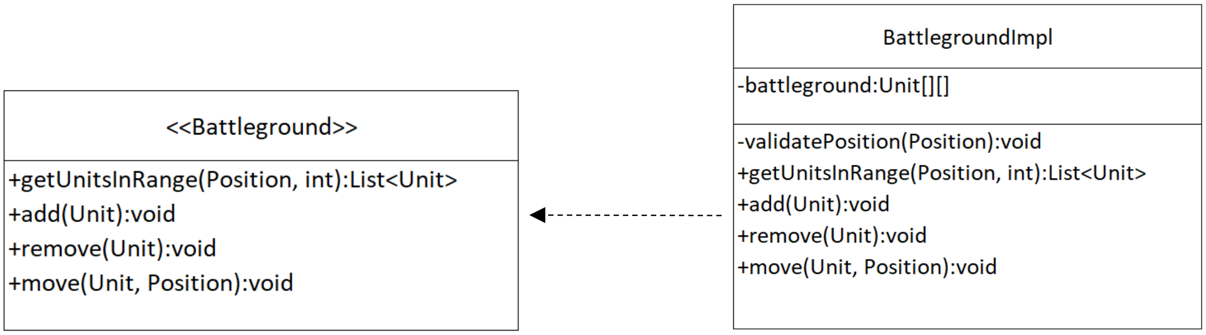
Engine



Battleground

Battleground has a fixed size: 5x5.

Throws InvalidPositionException in add(), remove() and move() in interface and in BattlegroundImpl.


BattlegroundImpl
-battleground:Unit[][]
-validatePosition(Position):void
+getUnitsInRange(Position, int):List<Unit>
+add(Unit):void
+remove(Unit):void
+move(Unit, Position):void
<<Battleground>>
+getUnitsInRange(Position, int):List<Unit>
+add(Unit):void
+remove(Unit):void
+move(Unit, Position):void

Unit

Each Unit has Type, Name and Coordinates of the Battleground.

Depending on the Type (Marine or Carrier), their qualities are:

Marine:

-RANGE = 1

-HEALTH_POINTS = 50

-ENERGY_POINTS = 80

-ATTACK_POINTS = 15

-DEFENCE_POINTS = 5

Marine spell: RageShoot => ENERGY_COST = 10

Carrier:

-RANGE = 2

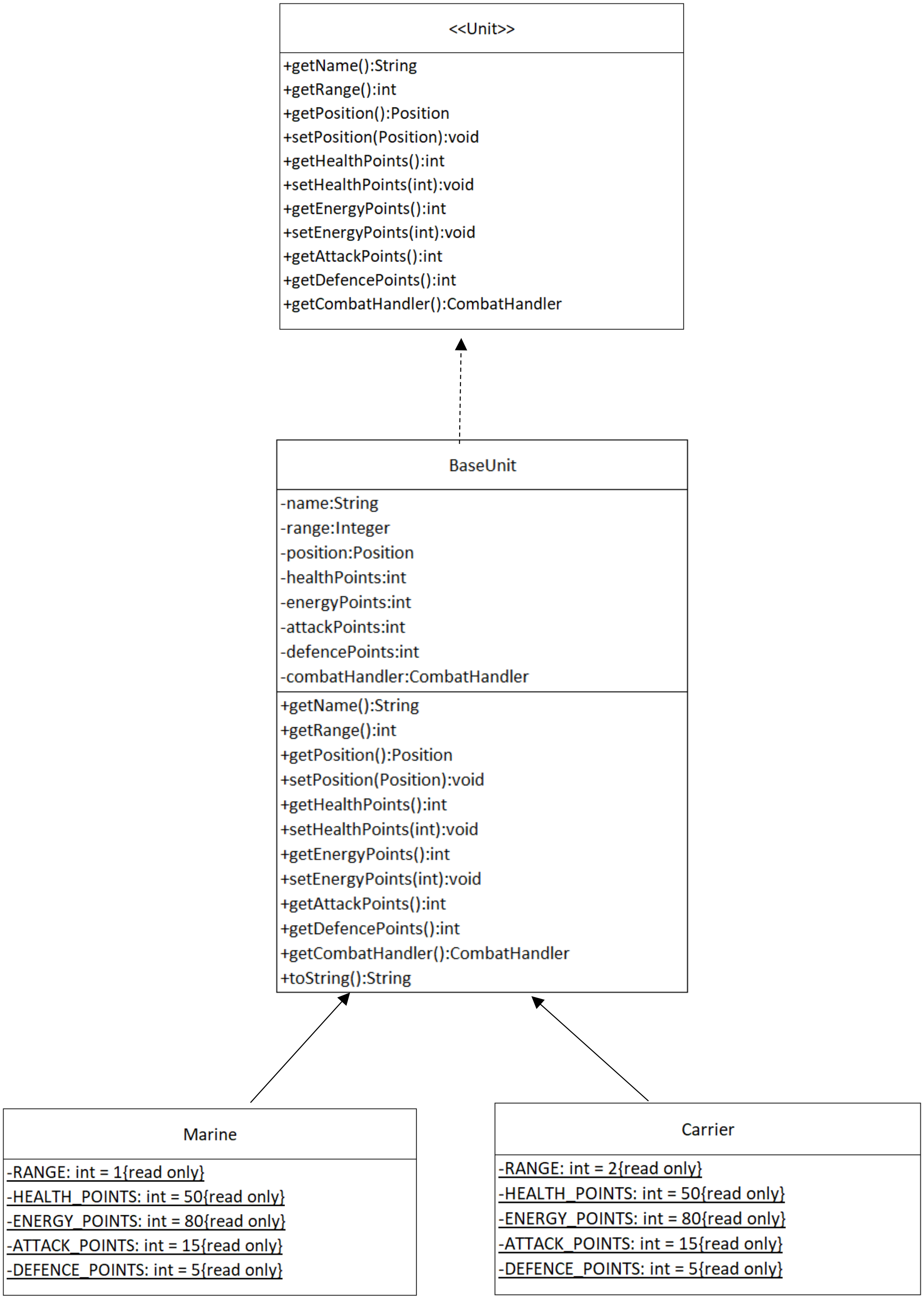
-HEALTH_POINTS = 50

-ENERGY_POINTS = 80

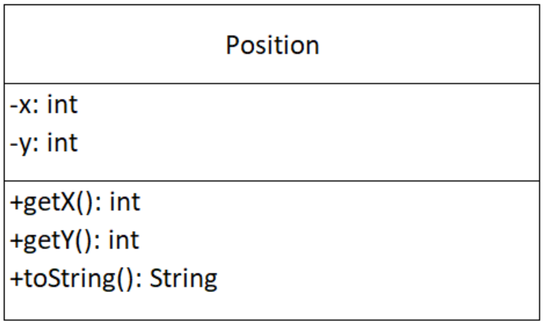
-ATTACK_POINTS = 15

-DEFENCE_POINTS = 5

Carrier spell: BulletRain => ENERGY_COST = 15


<<Unit>>
+getName():String
+getRange():int
+getPosition():Position
+setPosition(Position):void
+getHealthPoints():int
+setHealthPoints(int):void
+getEnergyPoints():int
+setEnergyPoints(int):void
+getAttackPoints():int
+getDefencePoints():int
+getCombatHandler():CombatHandler
BaseUnit
-name:String
-range:Integer
-position:Position
-healthPoints:int
-energyPoints:int
-attackPoints:int
-defencePoints:int
-combatHandler:CombatHandler
+getName():String
+getRange():int
+getPosition():Position
+setPosition(Position):void
+getHealthPoints():int
+setHealthPoints(int):void
+getEnergyPoints():int
+setEnergyPoints(int):void
+getAttackPoints():int
+getDefencePoints():int
+getCombatHandler():CombatHandler
+toString():String
Marine
-RANGE: int = 1{read only}
-HEALTH_POINTS: int = 50{read only}
-ENERGY_POINTS: int = 80{read only}
-ATTACK_POINTS: int = 15{read only}
-DEFENCE_POINTS: int = 5{read only}
Carrier
-RANGE: int = 2{read only}
-HEALTH_POINTS: int = 50{read only}
-ENERGY_POINTS: int = 80{read only}
-ATTACK_POINTS: int = 15{read only}
-DEFENCE_POINTS: int = 5{read only}

Position



Position

-x: int
-y: int

+getX(): int
+getY(): int
+toString(): String

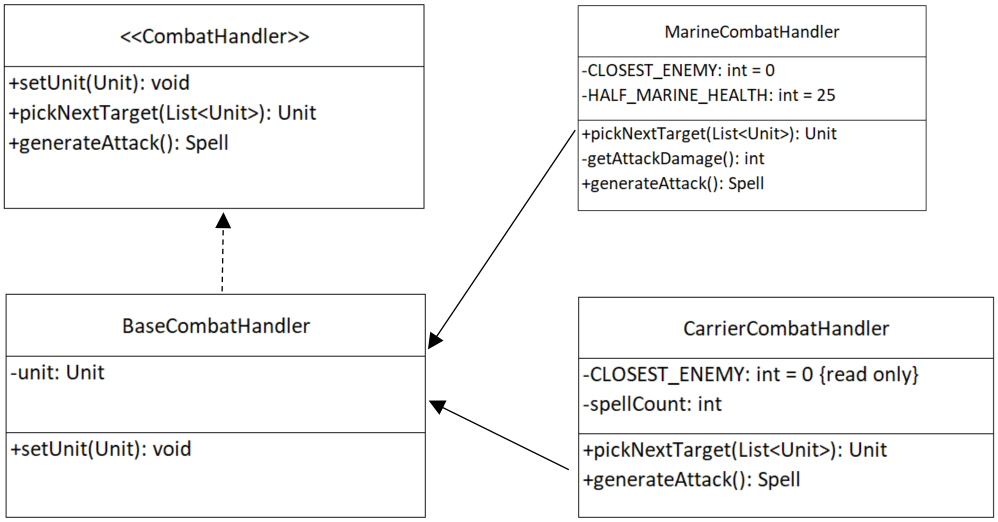
Combat Handler

Throws NotEnoughEnergyException in interface CombatHandler.

Throws NotEnoughEnergyException in class CarrierCombatHandler.

Throws NotEnoughEnergyException in class MarineCombatHandler.

When an unit chooses the target he picks one with **lower health points**. If on battleground have more than one unit with same lower points he **compare them by name**.



<<CombatHandler>>

+setUnit(Unit): void
+pickNextTarget(List<Unit>): Unit
+generateAttack(): Spell

MarineCombatHandler

-CLOSEST_ENEMY: int = 0
-HALF_MARINE_HEALTH: int = 25

+pickNextTarget(List<Unit>): Unit
-getAttackDamage(): int
+generateAttack(): Spell

BaseCombatHandler

-unit: Unit

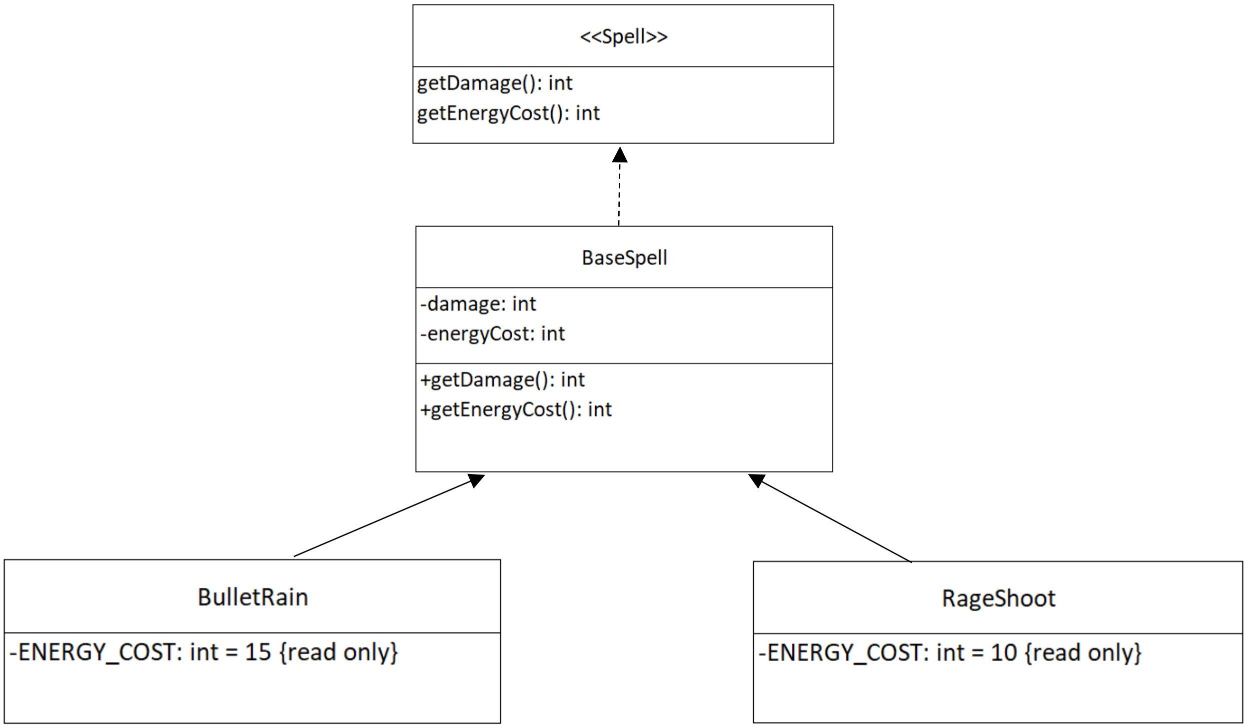
+setUnit(Unit): void

CarrierCombatHandler

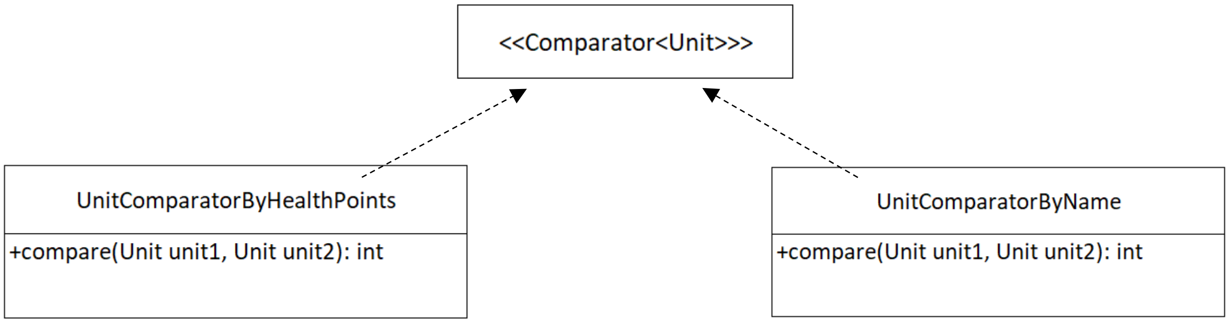
-CLOSEST_ENEMY: int = 0 {read only}
-spellCount: int

+pickNextTarget(List<Unit>): Unit
+generateAttack(): Spell

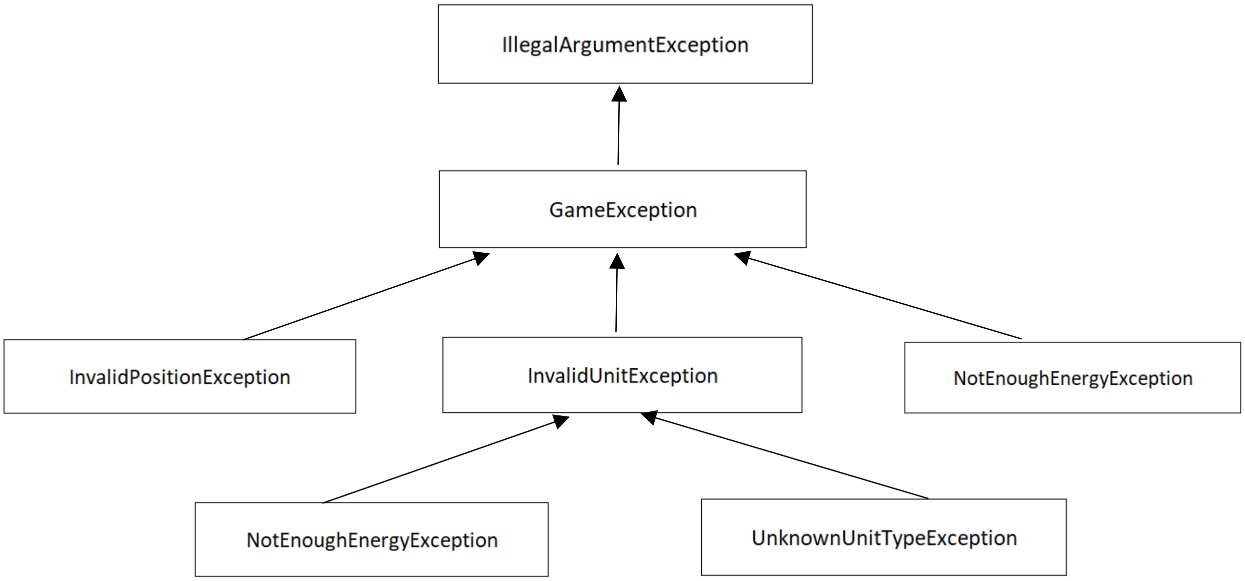
Spells



Comparators

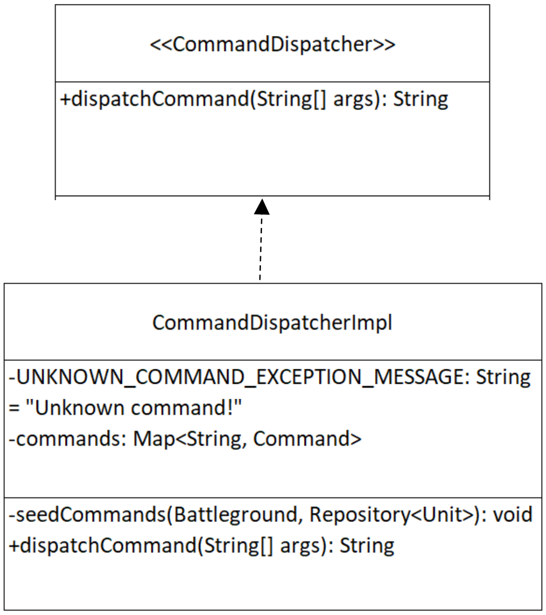

<<Comparator<Unit>>>
UnitComparatorByHealthPoints
+compare(Unit unit1, Unit unit2): int
UnitComparatorByName
+compare(Unit unit1, Unit unit2): int

Exceptions



Command Dispatcher

Throw GameException (UNKNOWN_COMMAND_EXCEPTION_MESSAGE).


<<CommandDispatcher>>
+dispatchCommand(String[] args): String
CommandDispatcherImpl
-UNKNOWN_COMMAND_EXCEPTION_MESSAGE: String = "Unknown command!"
-commands: Map<String, Command>
-seedCommands(Battleground, Repository<Unit>): void
+dispatchCommand(String[] args): String

Commands

When the command is invalid, print: “Unknown command!”.

All Commands:

- **Unknown command!**
- **spawn** {typeUnit} {name} {position} {position}

  - Valid command: {name} of type {typeUnit} has spawn @({position}, {position})

  - Invalid command:

    - Invalid unit type!

    - Coordinates are not correct!

    - There is an unit at this position, already!

- **status** <name>

  - Valid command: -

    >Gosho

    - Type: {typeUnit}

    - Position: ({position}, {position})

    - Attack Points: {attack points}

    - Defence Points: {defence points}

    - Energy Points: {energy points}

    - Health Points: {health points}

  - Invalid command:

    - Not exist unit with name {name}!

- **fight**

  - Valid command:

    - {name} cast RageShoot spell and did 15 damage

      {name} cast BulletRain spell and did 15 damage

    - {name} killed {name}

  - Invalid command:

    - No enough spawns for fight!

    - Units are outside range of their enemies, move closer and try again!

- **move**

  - Valid command:

    - {name} moved to ({position}, {position})

  - Invalid command:

    - There is an unit at this position, already!

    - Not exist unit with name {name}!

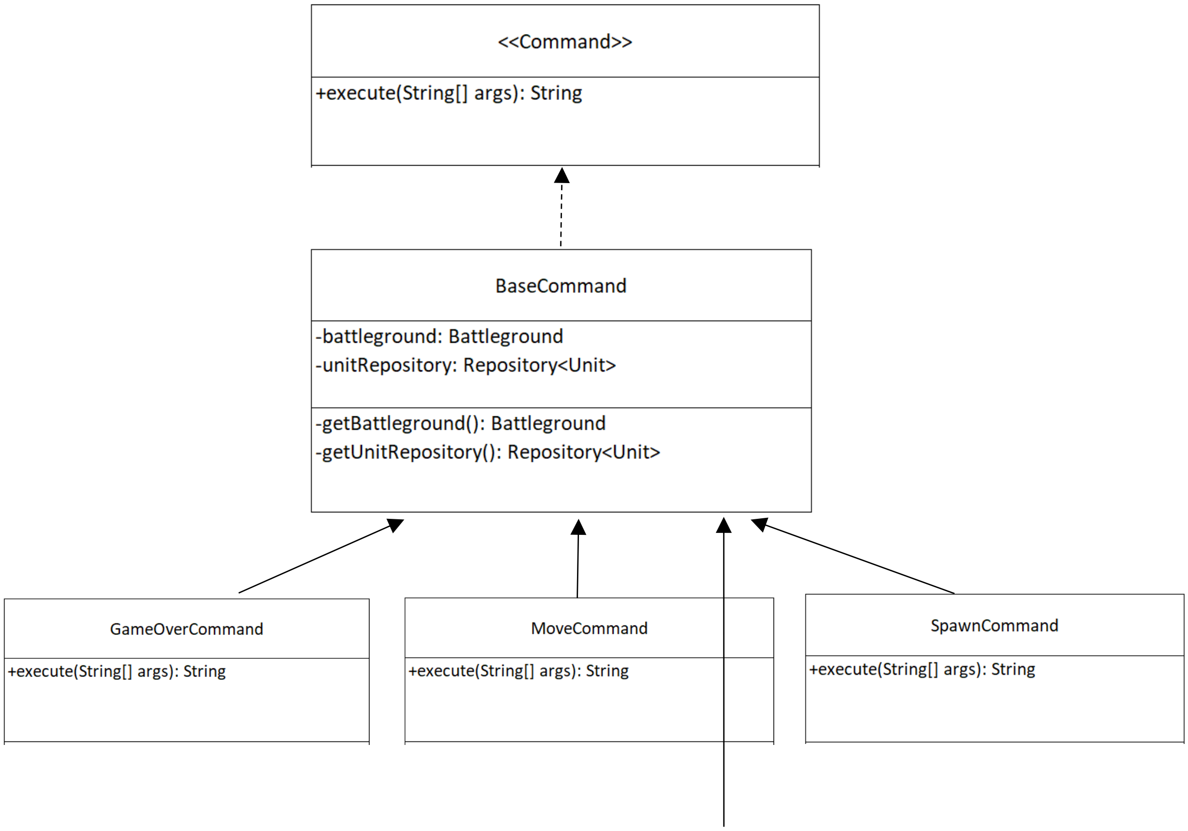
    - Coordinates are not correct!

- **game-over**

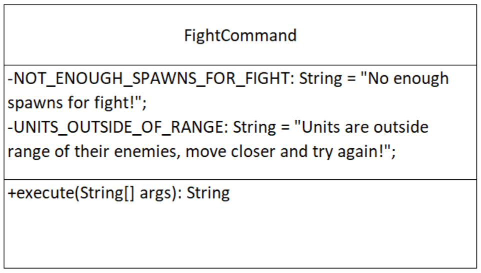
  - Valid command:

    - Game Over!

Throws **UnknownUnitTypeException, InvalidPositionException, NotEnoughEnergyException** in interface.



<<Command>>
+execute(String[] args): String
BaseCommand
-battleground: Battleground
-unitRepository: Repository<Unit>
-getBattleground(): Battleground
-getUnitRepository(): Repository<Unit>
GameOverCommand
+execute(String[] args): String
MoveCommand
+execute(String[] args): String
SpawnCommand
+execute(String[] args): String



FightCommand

-NOT_ENOUGH_SPAWNS_FOR_FIGHT: String = "No enough spawns for fight!";
-UNITS_OUTSIDE_OF_RANGE: String = "Units are outside range of their enemies, move closer and try again!";

+execute(String[] args): String

In spawn command we should **throws UnknownUnitTypeException, InvalidPositionException** with the appropriate messages.

In move command we should **throws InvalidPositionException, NotExistingUnitException** with the appropriate messages.

In game-over command we should throws **UnknownUnitTypeException, InvalidPositionException, NotEnoughEnergyException** with the appropriate messages.

In status command we should throws **NotExistingUnitException** with the appropriate messages.

In fight command we should throws **NotEnoughEnergyException** with the appropriate messages.

Exceptions Messages:

NOT_EXISTING_UNIT_EXCEPTION_MESSAGE = "Not exist unit with name %s!"

INVALID_UNIT_TYPE_EXCEPTION_MESSAGE = "Invalid unit type!"

NOT_ENOUGH_ENERGY_EXCEPTION_MESSAGE = "Not enough energy to produce the spell!"

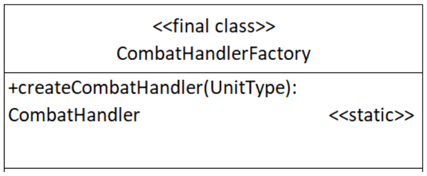
INVALID_COORDINATES_EXCEPTION_MESSAGE = "Coordinates are not correct!"

POSITION_NOT_EMPTY_EXCEPTION_MESSAGE = "There is an unit at this position, already!"

NO_UNIT_TO_REMOVE_EXCEPTION_MESSAGE = "There is not unit to remove!"

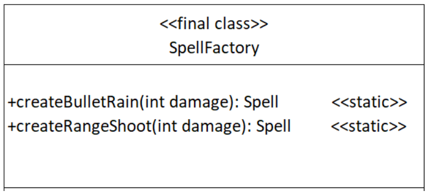
Factories

Throw new UnknownUnitTypeException("Provided unit type is unknown!") in CombatHandlerFactory, SpellFactory and UnitFactory.



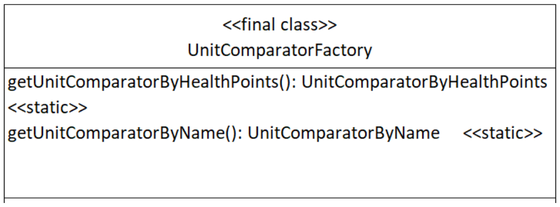
<<final class>>
CombatHandlerFactory

+createCombatHandler(UnitType): CombatHandler <<static>>



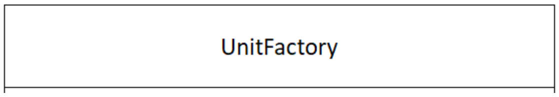
<<final class>>
SpellFactory

+createBulletRain(int damage): Spell <<static>>
+createRangeShoot(int damage): Spell <<static>>



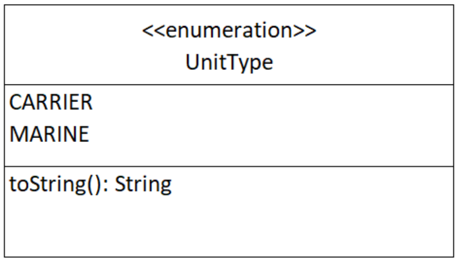
<<final class>>
UnitComparatorFactory

getUnitComparatorByHealthPoints(): UnitComparatorByHealthPoints <<static>>
getUnitComparatorByName(): UnitComparatorByName <<static>>



UnitFactory

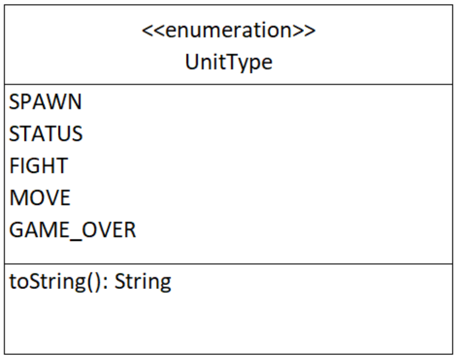
Enum



<<enumeration>>
UnitType

CARRIER
MARINE

toString(): String

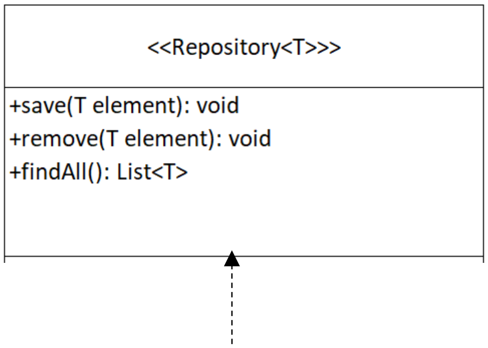


<<enumeration>>
UnitType

SPAWN
STATUS
FIGHT
MOVE
GAME_OVER

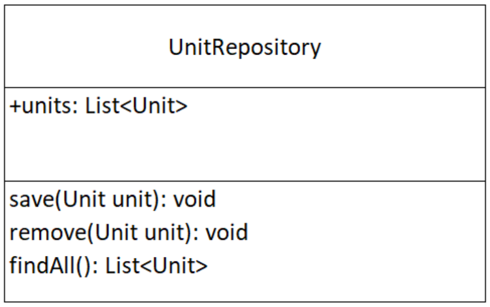
toString(): String

Repository



<<Repository<T>>>

+save(T element): void
+remove(T element): void
+findAll(): List<T>



Exception Messages Constants

NOT_EXISTING_UNIT_EXCEPTION_MESSAGE: String = "Not exist unit with name %s!"

INVALID_UNIT_TYPE_EXCEPTION_MESSAGE: String = "Invalid unit type!"

NOT_ENOUGH_ENERGY_EXCEPTION_MESSAGE: String = "Not enough energy to produce the spell!"

INVALID_COORDINATES_EXCEPTION_MESSAGE: String = "Coordinates are not correct!"

POSITION_NOT_EMPTY_EXCEPTION_MESSAGE: String = "There is an unit at this position, already!"

NO_UNIT_TO_REMOVE_EXCEPTION_MESSAGE: String = "There is not unit to remove!"

Game Constants

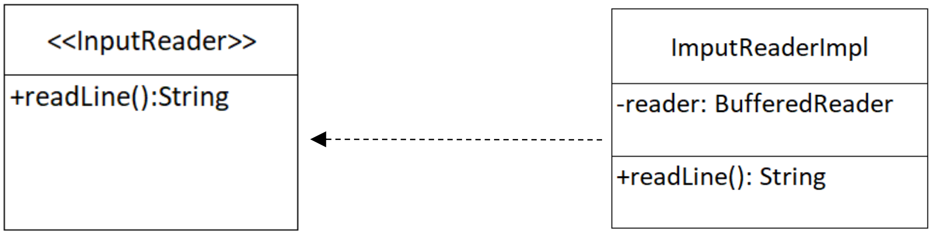
GAME_OVER_MESSAGE: String = "Game over!"

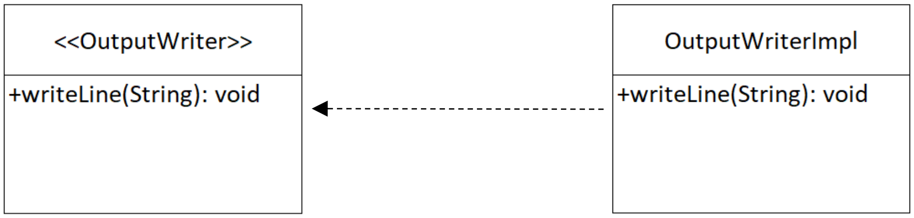
I / O (Input / Output)

Input

- The input will come in the form of commands, in the format specified above.
- The input sequence ends when you receive the command “**game-over**”.

Output





Constrains

- **All integers** in the input will be in **range [0, 4]**.
- **All strings** in the input may consist of **any ASCII character**, except **SPACE**
- Note that throughout the program, you are working **ONLY** with **INTEGERS**.

Examples

Output
spawn Marine Pesho 0 0 Pesho of type Marine has spawn @(0, 0) *spawn Carrier Gosho 4 4* Gosho of type Carrier has spawn @(4, 4) *fight* Units are outside range of their enemies, move closer and try again! *move Gosho 1 0* Gosho moved to (1, 0) *status Gosho* ->Gosho - Type: Carrier - Position: (1, 0) - Attack Points: 15 - Defence Points: 5 - Energy Points: 80 - Health Points: 50 *fightt* Unknown command! *fight* Pesho cast RageShoot spell and did 15 damage Gosho cast BulletRain spell and did 15 damage *status Gosho* ->Gosho - Type: Carrier

```
- Position: (1, 0)
- Attack Points: 15
- Defence Points: 5
- Energy Points: 65
- Health Points: 35
fight
Pesho cast RageShoot spell and did 15 damage
Gosho cast BulletRain spell and did 15 damage
fight
Pesho cast RageShoot spell and did 30 damage
Pesho killed Gosho
game-over
Game over!
```