

Room extends World

```

+ PORT_NUMBER : int = 56342
+ REFRESH_RATE : int = 10
+ FONT : Font
+ ORIGINAL : GreenfootImage
- changed : boolean
- hostname : String
- hosting : boolean
- serverSocket : ServerSocket
- clients : LinkedList<Socket>
- outStreams : LinkedList<ObjectOutputStream>
- inStreams : LinkedList<ObjectInputStream>
- listeningThread : Thread
- lastUpdateTime : long
- socket : Socket
- counter : int
- inStream : ObjectInputStream
- outStream : ObjectOutputStream

```

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+ Room(hosting : boolean, hostname : String)
+ stopped()
- setupServer()
- setupClient()
- listenForSockets()
- update()
- updateClients()
- closeServer()
- closeClient()
- drawHostName()
- drawClientNames()
+ getOutputStreams() : List<ObjectOutputStream>
+ getInputStreams() : List<ObjectInputStream>

```

Game extends ChildWorld implements Serializable

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+ SAVE_FILE_NAME : String = "Save.txt"
+ PLAYER_UPDATE_RATE : int = 100
+ MULTIPLAYER_GREENFOOT_SPEED : int = 50
- user : Player
- enemy : AI
- map : Map

```

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+ Game()
+ Game(serverSocket : ServerSocket, inStreams : List<ObjectInputStream>, outStreams : List<ObjectOutputStream>)

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+ Game(inStream : ObjectInputStream, outStream : ObjectOutputStream)
- configureGreenfoot()
- setup()
- setupServer()
- setupClient()
- handleUpdates()
- changeCell(data : Object[])
- cloneCell(toClone : Cell) : Cell
- createUnit(unit : Unit)
- getTwinPlayer(otherPlayer : Player) : Player
- updateUnitPath(data : List<int[]>)
+ sendUpdate(update : Update)
+ sendRequest(request : Request)
- getTwinUnit(otherUnit : Unit) : Unit
- handleRequests()
- selectUnits(data : Object[] )
- setupMultiplayerMap()
- setupUI()
+ save()
- readObject(stream : ObjectInputStream) <<IOException>>, <<ClassNotFoundException>>
- spawnUnit(unit : Unit, cell : Cell)
- restoreUnits()
+ stopped()
+ getUser : Player
+ getEnemy : Player
+ getMap() : Map
+ getActionsPanel() : ActionsPanel
+ getInformationPanel() : InformationPanel

```

TeamColor extends Actor

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- image : GreenfootImage
- unitToFollow : Unit

```

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+TeamColor (blue : boolean, unitToFollow : Unit)
+ moveTo (x : int , y : int)
- arrowsAtBorder()

```

Projectile extends Actor

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- image : GreenfootImage
- bloodyMess : GreenfootImage
- lifeSpan : int = 0
- bloodSplatter : int = 0
- distanceToTarget : double
- target : Actor

```

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|--|
| - tX : int - tY : int - reachedTarget : boolean |
| + Projectile(target : Actor) + Projectile(target : Actor, temp : boolean) |

Button extends Actor

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| - popup: Popup |
| + Button(image : GreenfootImage) + forceRemovePopup() + click() + getHoverInfo() : String + Popup getPopup() |

Map extends Actor implements Serializable

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| + SIZE_X : int = 1280 + SIZE_Y : int = 468 + CELLS_X : int = 101 + CELLS_Y : int = 51 + MIN_CELL_SIZE : int = 48 + MAX_CELL_SIZE : int = 64 - cells : Cell[][] - Selector : selector - selectedUnits : List<Unit> - viewX : int - viewY : int - cellSize : int = MIN_CELL_SIZE - selectorStartX: int - selectorStartY: int + changed : boolean |
| + Map(world : World) + setFrame(world : World) + placeCells(world : World) - setupCells(world : World) - setupPathfinding() - readObject(stream : ObjectInputStream) <<IOException>>, <<ClassNotFoundException>> - pan(xChange : int , yChange : int) - calculateCellPositions() - calculateUnitPositions() + update() |

```

+ getChanged() : boolean
+ setChanged(changed : boolean)
+ getCellSize() : int
+ changeCellSize(change : int)
+ setCell(x : int, y : int, cell : Cell)
+ getCells() : Cell[][]
+ getViewX() : int
+ getViewY() : int
+ setViewX(viewX : int)
+ setViewY(viewY : int)

```

Minimap extends Actor

```

+ GRASS_COLOR : Color = new Color(42, 120, 42)
+ NATURE_COLOR : Color = new Color(165, 120, 42)
+ FRIENDLY_BUILDING_COLOR : Color = Color.BLUE
+ FRIENDLY_UNIT_COLOR : Color = Color.CYAN
+ ENEMY_BUILDING_COLOR : Color = Color.RED
+ ENEMY_UNIT_COLOR : Color = Color.MAGENTA
+ BERRY_BUSH_COLOR : Color = new Color(186, 129, 176)
+ MINE_COLOR : Color = Color.YELLOW
+ SIZE_X : int = 560
+ SIZE_Y : int = 220
+ REFRESH_RATE : int = 5
- counter : int

+ update()

```

InformationPanel extends Actor

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- ORIGINAL : GreenfootImage
- FONT : Font

+ InformationPanel()
+ display(lines : String)

```

Cell extends Actor

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- x : int
- y : int
- hidden : boolean
- visited : boolean
- parent : Cell
- neighbours : LinkedList<Cell>
# traversable : boolean

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|--|
| # stats : String |
| + Cell(x : int, y : int, cellSize : int) + resetPathfinding(game : Game) + copyCellData(original : Cell, copy : Cell) + calculateNewLocation(map : Map) + resize(side : int) + getMapX() : int + getMapY() : int + getAbsoluteX(map : Map) : int + getAbsoluteY(map : Map) : int - replaceNeighbour (toRemove : Cell, toAdd : Cell) + destroy() + addNeighbour(neighbour : Cell) + getNeighbours() : LinkedList<Cell> + getVisited() : boolean + visit(parent : Cell) + getTraversable() : boolean + setTraversable(t : boolean) + getParent() : Cell + <i>getOriginalImage()</i> : GreenfootImage - readObject(stream : ObjectInputStream) <<IOException>>, <<ClassNotFoundException>> |

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|--|
| Building extends Cell |
| # owner : Player # health : int # counter : int # structureName : String # informationPanel : InformationPanel # spawnPoint : SpawnPoint |
| + Building(owner : Player, x : int, y : int, cellSize : int) + getButtons() : LinkedList<Button> + destroy() + checkResources(unit : Unit) : boolean + addUnitToMultiplayer(unit : Unit) + int getHealth() + changeHealth(change : int) + setAge() + getOwner() : Player # <i>getSpecificButtons()</i> : LinkedList<Button> |

| |
|----------------------------|
| Nature extends Cell |
| # stats : String |

+ Nature (x : int, y : int, cellSize : int)

Unit extends Actor

```

+ CIVILIAN : int = 0
+ MELEE_INFANTRY : int = 1
+ RANGED_INFANTRY : int = 2
+ MELEE_CAVALRY : int = 3
+ RANGED_CAVALRY : int = 4
+ SIEGE : int = 5
+ UP : int = 1
+ RIGHT : int = 2
+ DOWN : int = 3
+ LEFT : int = 4
- PATHFINDER_REFRESH_RATE : int = 25
- IDCounter : int
# debugger : int = 0
# speed : int = 5
# facingDirection : int
# target : Unit
# targetBuilding : Building
# path : LinkedList<Cell>
# currentCell : Cell
# selectedCell : Cell
# targetCell : Cell
# absoluteX : int
# absoluteY : int
# hidden : boolean
# isMoving : boolean
# following : boolean
# teamPlayer : boolean
# pathfinderCounter : int = 0
- healthBar : HealthBar
- runFirstTime : boolean = false
# team : int
# type : int
# ID : int
# unit : String
# spawned : boolean
# health : double
# currentHealth : double
# attack : double
# meleeArmour : double
# rangedArmour : double
# siegeArmour : double
# range : int
# attackSpeed : int
# owner : Player

```

```

# attackTimer : int
# meleeInfantry : double
# rangedInfantry : double
# meleeCavalry : double
# rangedCavalry : double
# siege : double
# building : double

+ Unit(Player owner, Cell cell, Map map)
+ getLeftImage() : GreenfootImage
+ getRightImage() : GreenfootImage
+ getFrontImage() : GreenfootImage
+ getBackImage() : GreenfootImage
+ attack()
+ clientAttack(Object : Object)
+ takeDamage(damage : double)
- calculateDamageToInflict() : double
+ arrive()
+ selectCell(cell : Cell)
+ selectUnit(unit : Unit)
+ calculateNewLocation(map : Map)
+ resize(percentChange : double, map : Map)
+ updateImage(map : Map, image : GreenfootImage)
# findPath() <<NoPossiblePathException>>
- travelPath()
- travelToCell(cell : Cell)
- updateHiding(x : int, y : int)
- move (xChange : int, yChange : int)
- fireProjectile(targetOfInterest : Unit)
- slaughterByStanders(unit : Unit)
+ getAbsX() : int
+ getAbsY() : int
+ getCell() : Cell

```

Civilian extends Unit

```

+ FOOD_COST : int = 100
+ WOOD_COST : int = 0
+ GOLD_COST : int = 0
+ NONE : int = 0
+ FOOD : int = 1
+ WOOD : int = 2
+ GOLD : int = 3
- FRONT : GreenfootImage = new GreenfootImage("CivilianFront.png")
- RIGHT : GreenfootImage = new GreenfootImage("CivilianRight.png")
- LEFT : GreenfootImage = new GreenfootImage("CivilianLeft.png")
- BACK : GreenfootImage = new GreenfootImage("CivilianBack.png")
- gatheringCell : Cell

```

```

- resourceTimer : int
- gatherTime = 30 : int
- SPAWN_TIME : int = 100
- currentResource : int

+ Civilian(owner : Player, cell : Cell, map : Map)
+ selectCell(cell : Cell)
+ arrive()
+ getButtons() : LinkedList<Button>
+ getCurrentResource() : int
+ getInformation() : String
+ getLeftImage() : GreenfootImage
+ getRightImage() : GreenfootImage
+ getFrontImage() : GreenfootImage
+ getBackImage() : GreenfootImage

```

ActionsPanel extends Actor

```

- WIDTH : int = 718
- HEIGHT : int = 180
- buttons : LinkedList<Button>

+ ActionsPanel()
+ setButtons(buttons : LinkedList<Button>)

```

<<Interface>> **Gatherable****Player** implements **Serializable**

```

+ POP_CAP : int = 100
+ WOOD : int = 0
+ FOOD : int = 1
+ GOLD : int = 2
+ AGE : int = 3
+ MAX_POPULATION : int = 4
- IDCounter : int
# buildings : LinkedList<Building>
# units : LinkedList<Unit>
# center : Center
# ID : int
# wood : int
# food : int
# gold : int

```



```

# age : int
# maxPopulation : int
# agingUp : boolean

+ Player()
+ updateClients(game : Game, field : int)
+ updateField(field : int, value : int)
+ changeWood(game : Game, change : int)
+ changeFood(game : Game, change : int)
+ changeGold(game : Game, change : int)
+ getWood() : int
+ getFood() : int
+ getGold() : int
+ getAge() : int
+ getBuildings() : LinkedList
+ getUnits() : LinkedList
+ setAge(game : Game, age : int)

```

AI extends **Player**

Request implements **Serializable**

```

+ SELECT : int = 1
+ CHANGE_CELL : int = 2
+ DELETE_UNIT : int = 3
+ CREATE_UNIT : int = 4
+ AGE_UP : int = 5
- type : int
- data : Object

```

```

+ Request(type : int, data : Object)
+ getType() : int
+ getData() : Object

```

<<Interface>> **Selectable**

```

+ getButtons() : LinkedList<Button>
+ getInformation() : String

```

Update implements **Serializable**

```
+ START_GAME : int = 0  
+ END_GAME : int = 1  
+ PLAYER_UPDATE : int = 2  
+ CHANGE_CELL : int = 3  
+ UNIT_PATH_CHANGE : int = 4  
+ UNIT_CREATION : int = 5  
+ UNIT_DESTRUCTION : int = 6  
+ UNIT_ATTACK : int = 7  
+ AGE_UP : int = 8  
- type : int  
- data : Object
```

```
+ Update(type : int, data : Object)  
+ getType() : int  
+ getData() : Object
```