Coordinate

```
X:SimpleDoubleProperty
Y:SimpleDoubleProperty
```
```
getX():int
getY():int
getXProperty():SimpleDoubleProperty
getYProperty():SimpleDoubleProperty
getHeading():int
setX(int):void
setY(int):void
setHeading(int):void
toString():String
getAngle(Coordinate):double
```

<<enum>> ActorTypes

```
PLAYER
ALIENSHIP1
ALIENSHIP2
ALIENSHIP3
ARTIFACT
ASTEROID
PROJECTILE1_PLAYER
PROJECTILE1_ALIEN
PROJECTILE2_ALIEN
PROJECTILE3_ALIEN
```

Difficulty

```
enemySpeedMult:double
enemyHealthMult:double
poitnsMult:double
spawnRateForAsteroids:int
spawnRateForArtifacts:int
spawnRateForTier1:int
spawnRateForTier2:int
spawnRateForTier3:int
chosenDifficulty:DifficultyTypes
```

<<enum>> DifficultyTypes

```
EASY
NORMAL
HARD
```

Actor

```
actortype:ActorTypes
location:Coordinate
id:int
direction:int
speed:int
hitpoints:int
directionProerty:IntegerProperty
imgwidth:int
imglength:int
nextID:int
isPlacedOnScreen:boolean
forceOutOfScreen:boolean
collided:boolean
collidedsoundplay:boolean
stageXMin:int
stageXMax:int
stageYMin:int
stageYMax:int
stageOffset:int
previouslocation:Coordinate
cooldowntimer:int
collisionTimer:int
```
```
getID():int
setID(int):void
getActorType():ActorTypes
getDirection():int
setDirection(int):void
getSpeed():int
setSpeed(int):void
getHitpoints():int
getLocation():Coordinate
getWidth():int
getLength():int
setWidth(int):void
setLength(int):void
getNextID():int
setNextID(int):void
isDead():boolean
isCollided():boolean
updatePosition():void
deserialize(String):void

collision(Actor):void
collisionCooldown():void
updatePosition():void
spawnMe():void
moveMe():void
deserialize(String):void
toString():String
initializeHitpoints(int):void
```

AlienShipTier1

```
reloadSpeedInTicks:int
cooldowntimer:int
```
```
updatePosition():void
spawnMe():void
firingBehavior():boolean
fireProjectile():ProjectileAlien1
```

AlienShipTier2

```
chargeDistance:int
chargeTime:int
timer:int
```
```
updatePosition():void
getDirectionToPlayer(Player):int
spawnMe():void
```

AlienShipTier3

```
boundaryDistance:int
stayTime:int
stationaryTimer:int
reloadSpeedInTicks:int
cooldowntimer:int
onLeftSide:boolean
onRightSide:boolean
stateStationary:boolean
stateEnter:boolean
stateLeave:boolean
xInitialPos:double
slideYDistance:double
slideup:boolean
lastFired:ProjectileAlien2
```
```
updatePosition():void
spawnMe():void
getDirectionToPlayer():int
firingBehavior():boolean
fireProjectile():ProjectileAlien2
```

ProjectileAlien1

```
owner:Actor
```
```
updatePosition():void
spawnMe():void
```

ProjectileAlien2

```
owner:Actor
heightStretch:double
lifespanTime:int
timer:int
```
```
updatePosition():void
spawnMe():void
```

Asteroid

```
spawnonLeftSide:boolean
spawnonRightSide:boolean
```
```
updatePosition():void
spawnMe():void
spawnonLeftSide():void
spawnonRightSide():void
```

Artifact

```
timelimit:double
timer:double
collected:boolean
```
```
updatePosition():void
spawnMe():void
isTimerUp():boolean
```

Player

```
username:String
distanceTraveled:int
inputdirection:String
reloadSpeedInTicks:int
megaBombUsed:boolean
ALIENTIER1WORTH:int
ALIENTIER2WORTH:int
ALIENTIER3WORTH:int
ARTIFACTVALUE:int
totalalienskilled:int
artifactscollected:int
totalpoints:int
```
```
bindPlayerShip():void
updatePosition():void
collision(Actor):void
fireProjectile():ProjectilePlayer
useMegaBomb():void
addPoints(Actor):void
deserialize(String):void
toString():String
```

ProjectilePlayer

```
projectileoffsetX:int
projectileoffsetY:int
player:Player
```
```
updatePosition():void
spawnMe():void
```

GameController

```
world: World
GAMESTATE_FILENAME:String
error:String
```
```
load():boolean
save():boolean
getWorld():World
instance():GameController
reset():void
```

World

```
activeActors:ArrayList<Actor>
removedActors:ArrayList<Actor>
difficultyLevel:Difficulty
gameMode:StageTypes
gameover:boolean
stage:StageTypes
isLoadedGame:boolean
player:Player
cheat:boolean
wave:int
xyoffset:int
gameTicksPerSecond:int
endless:EndlessMode
```
```
playerMoveForward():void
playerMoveBackward():void
playerMoveLeft():void
playerMoveRight():void
playerFireProjectile():void
playerCheatModePressed():void
beginGame(StageTypes,String,DifficultyTypes):void
playActors():void
collisionHandling(Actor):void
exitActors():void
run():void
spawnActors():void
spawnEnemyProjectiles():void
adjustActorDifficulty(StageTypes,String,DifficultyTypes):void
count(ActorTypes):int
getSpecificActors(ActorTypes):Object[]
```

SerializationHandler

```
save(String,World):boolean
load(String,World):boolean
```

<<enum>> StageTypes

```
ENDLESS
LEVEL1
LEVEL2
LEVEL3
```

EndlessMode

```
spawSpecificActor(Difficulty,ActorTypes):void
spawnActorsProcess(Difficulty,ActorTypes):List<Actor>
checkForOverlap(List<Actor>):double
```

DisplayActor

```
actor:Actor
actorimg:Image
currentPost:Coordinate
width:double
length:double
cornerX:double
cornderY:double
onScreen:boolean
```