AstroExplorer

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Game Demo

Use Cases:

UC-01 Move with Jetpack

UC-03 Monitor Statistics

Flyweight Design Pattern

- We needed a world generation method.
- Definition: “Facilitates the reuse of many fine grained objects, making the utilization of large numbers of objects more efficient..”
- State-dependent (extrinsic) part
  - Class: Tile type
- State-independent (intrinsic) part
  - TileContext

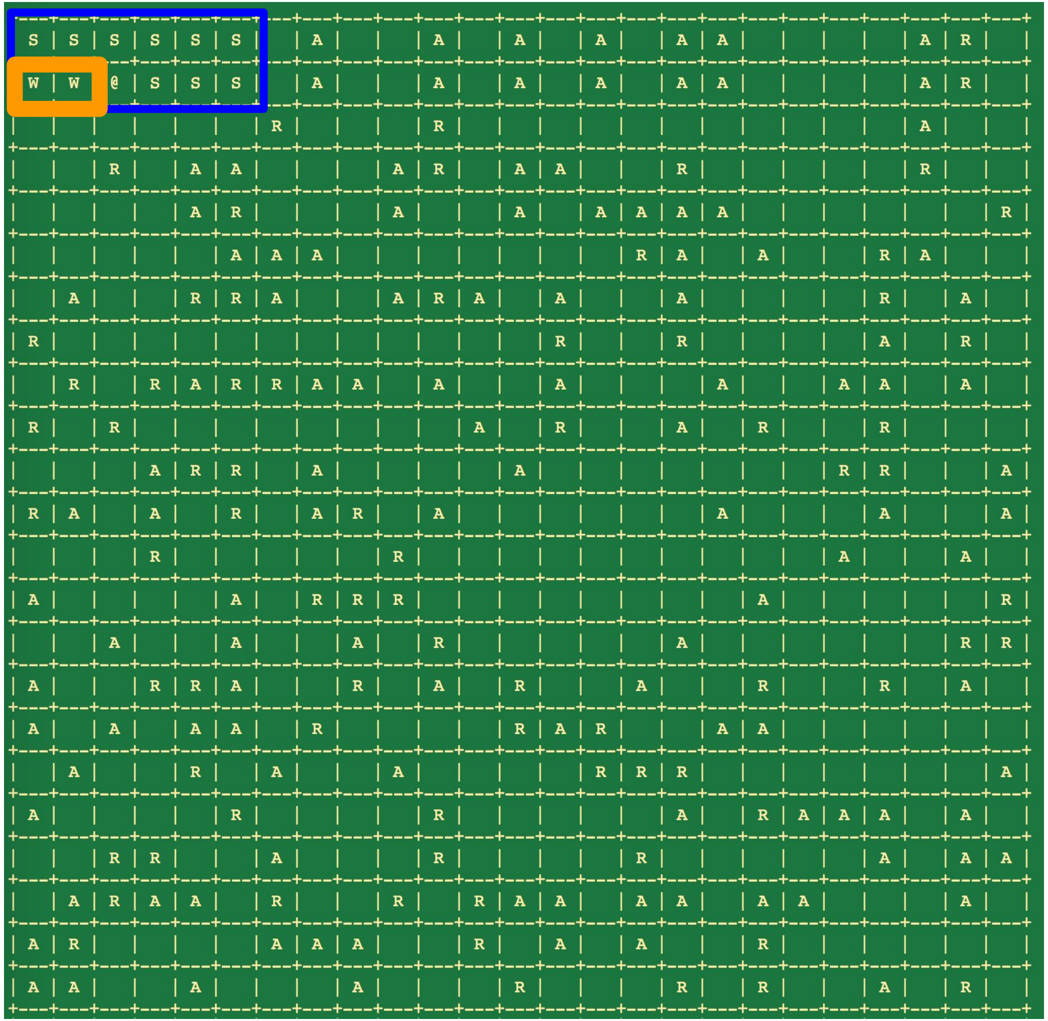
🟦 = Ship Interior

🟧 = Shop Interior

R: Resource

- Iron, Copper, Gold

A: Asteroid



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| R |   |   |   |   |   |   |   |   |   |   |   |   | R |   |   | R |   |   |   |   | A |   | R |   |
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|   | R |   | R | A | R | R | A | A |   | A |   |   | A |   |   |   | A |   |   | A | A |   | A |   |
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| R |   | R |   |   |   |   |   |   |   |   | A |   | R |   |   | A |   | R |   |   | R |   |   |   |
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| A |   |   | R | R | A |   |   | R |   | A |   | R |   |   | A |   |   | R |   |   | R |   | A |   |
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| A |   | A |   | A | A |   | R |   |   |   |   | R | A | R |   |   | A | A |   |   |   |   |   |   |
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|   | A |   |   | R |   | A |   |   | A |   |   |   |   | R | R | R |   |   |   |   |   |   |   | A |
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| A |   |   |   |   | R |   |   |   |   | R |   |   |   |   |   | A |   | R | A | A | A |   | A |   |
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|   | A | R | A | A |   | R |   |   | R |   | R | A | A |   | A | A |   | A | A |   |   |   | A |   |
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| A | R |   |   |   |   | A | A | A |   |   | R |   | A |   | A |   |   | R |   |   |   |   |   |   |
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| A | A |   |   | A |   |   |   | A |   |   |   | R |   |   |   | R |   | R |   |   | A |   | R |   |
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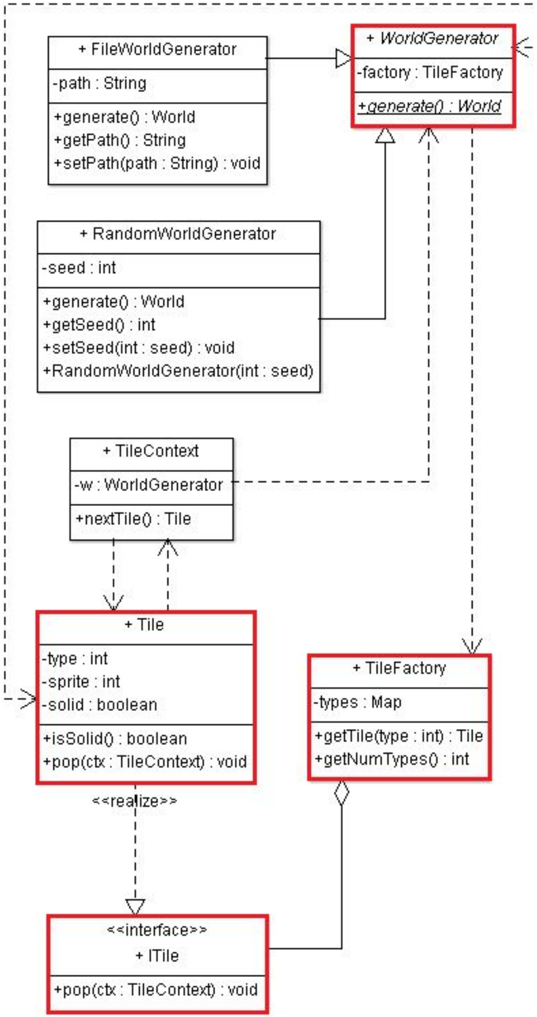
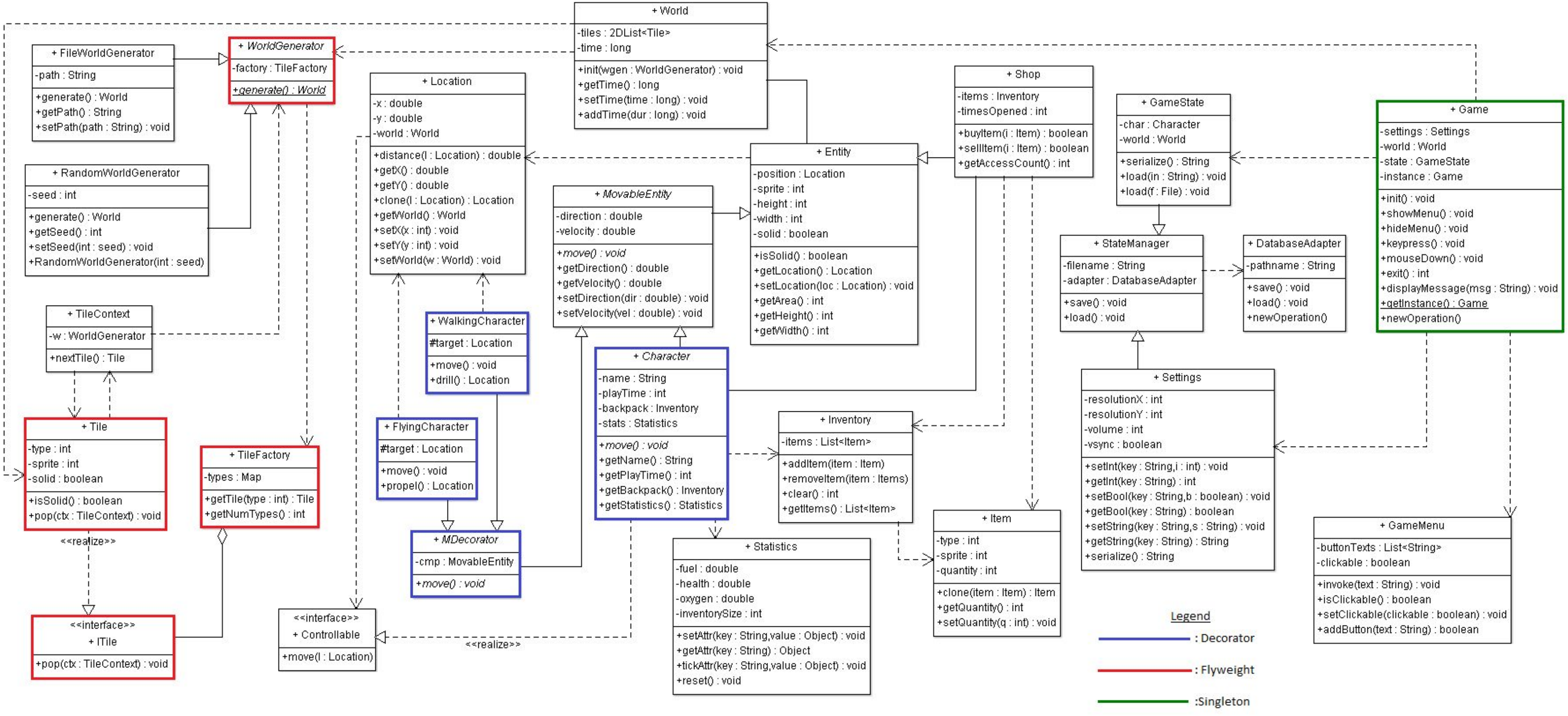
Flyweight on Class Diagram

- The outlined classes are the flyweight portion of the diagram.
  - TileFactory
  - ITile interface
  - Tile
  - WorldGenerator
- Usages
  - RandomWorldGenerator
  - TileContext



Class Diagram



+ World
-tiles : 2DList<Tile>
-time : long
+init(wgen : WorldGenerator) : void
+getTime() : long
+setTime(time : long) : void
+addTime(dur : long) : void

+ FileWorldGenerator
-path : String
+generate() : World
+getPath() : String
+setPath(path : String) : void

+ WorldGenerator
-factory : TileFactory
+generate() : World

+ RandomWorldGenerator
-seed : int
+generate() : World
+getSeed() : int
+setSeed(int : seed) : void
+RandomWorldGenerator(int : seed)

+ TileContext
-w : WorldGenerator
+nextTile() : Tile

+ Tile
-type : int
-sprite : int
-solid : boolean
+isSolid() : boolean
+pop(ctx : TileContext) : void

<<realize>>

<<interface>>
+ ITile
+pop(ctx : TileContext) : void

+ TileFactory
-types : Map
+getTile(type : int) : Tile
+getNumTypes() : int

+ Location
-x : double
-y : double
-world : World
+distance(l : Location) : double
+getX() : double
+getY() : double
+clone(l : Location) : Location
+getWorld() : World
+setX(x : int) : void
+setY(y : int) : void
+setWorld(w : World) : void

+ WalkingCharacter
#target : Location
+move() : void
+drill() : Location

+ FlyingCharacter
#target : Location
+move() : void
+propel() : Location

+ MDecorator
-cmp : MovableEntity
+move() : void

<<interface>>
+ Controllable
+move(l : Location)

<<realize>>

+ MovableEntity
-direction : double
-velocity : double
+move() : void
+getDirection() : double
+getVelocity() : double
+setDirection(dir : double) : void
+setVelocity(vel : double) : void

+ Character
-name : String
-playTime : int
-backpack : Inventory
-stats : Statistics
+move() : void
+getName() : String
+getPlayTime() : int
+getBackpack() : Inventory
+getStatistics() : Statistics

+ Entity
-position : Location
-sprite : int
-height : int
-width : int
-solid : boolean
+isSolid() : boolean
+getLocation() : Location
+setLocation(loc : Location) : void
+getArea() : int
+getHeight() : int
+getWidth() : int

+ Statistics
-fuel : double
-health : double
-oxygen : double
-inventorySize : int
+setAttr(key : String,value : Object) : void
+getAttr(key : String) : Object
+tickAttr(key : String,value : Object) : void
+reset() : void

+ Inventory
-items : List<Item>
+addItem(item : Item)
+removeItem(item : Items)
+clear() : int
+getItems() : List<Item>

+ Shop
-items : Inventory
-timesOpened : int
+buyItem(i : Item) : boolean
+sellItem(i : Item) : boolean
+getAccessCount() : int

+ Item
-type : int
-sprite : int
-quantity : int
+clone(item : Item) : Item
+getQuantity() : int
+setQuantity(q : int) : void

+ GameState
-char : Character
-world : World
+serialize() : String
+load(in : String) : void
+load(f : File) : void

+ StateManager
-filename : String
-adapter : DatabaseAdapter
+save() : void
+load() : void

+ DatabaseAdapter
-pathname : String
+save() : void
+load() : void
+newOperation()

+ Settings
-resolutionX : int
-resolutionY : int
-volume : int
-vsync : boolean
+setInt(key : String,i : int) : void
+getInt(key : String) : int
+setBool(key : String,b : boolean) : void
+getBool(key : String) : boolean
+setString(key : String,s : String) : void
+getString(key : String) : String
+serialize() : String

+ Game
-settings : Settings
-world : World
-state : GameState
-instance : Game
+init() : void
+showMenu() : void
+hideMenu() : void
+keypress() : void
+mouseDown() : void
+exit() : int
+displayMessage(msg : String) : void
<u>+getInstance() : Game</u>
+newOperation()

+ GameMenu
-buttonTexts : List<String>
-clickable : boolean
+invoke(text : String) : void
+isClickable() : boolean
+setClickable(clickable : boolean) : void
+addButton(text : String) : boolean

<u>Legend</u>

: Decorator

: Flyweight

:Singleton