

Game

- Start the game in its Main function
- Hold a Level instance
- Plan and execute the update and render functions of the Level

- SuperLevel

SuperLevel

- Hold, update and render a Level
- Be able to restart its Level

- Level

Abstract

Level

- Hold a Player instance
- Hold and manage an ArrayList of all the Entities
- Call the update and render methods of the Player and Entity instances
- Be able to return a new instance of itself

- SuperLevel
- Player
- Entity

Interface

Entity

- Having the functions update and render
- Be able to be initialised with a level
- Be able to return its BoxCollider ArrayList
- Doing the Camera render calls

- Level

Player

Entity

- Reacting to inputs by moving its BoxCollider using euler integration based physics

- BoxCollider
- Keyboard
- Mouse

Camera

- Render a Line3d object by projecting it to a Line2d using the functions of its Projector instance and render it on a Graphics instance

- Line3d
- Line2d
- Projector
- Graphics

Projector

- Project a world relative Vector3d to a Vector2d containing the pixel coordinates using the following 3 steps:
- 1. Transform from a world relative Vector3d to a Camera relative Vector3d
- 2. Transform from a Camera relative Vector3d to a 2d-plane relative Vector2d
- 3. Transform from a 2d-plane relative Vector2d to a Vector2d holding the pixel coordinates

- Matrix3x3d
- Vector3d
- Vector2d

BoxCollider

- Manage a static BoxCollider ArrayList
- Add itself to the ArrayList on construction
- Have a remove function for removing itself from the ArrayList
- Have a boolean named Immovable for collision reaction
- Have a function called collision returning a boolean (collision detection)
- Have a function called move (collision reaction)

- Vector3d

Keyboard

KeyListener

- Update its static variables for the states of all the keyboard keys

| Mouse | | MouseListener |
|-----------------------------------------------------------------------------------------------------------------------------------------|--|---------------|
| <ul style="list-style-type: none">Update its static variables for the mouse x and y position and the state of its buttons | | |

| Vector3d | | |
|--------------------------------------------------------------------------------------------------------------------------------------|--|--|
| <ul style="list-style-type: none">Hold its x, y and z coordinates as doublesCalculate its magnitude on demand | | |

| Vector2d | | |
|-----------------------------------------------------------------------------------------------------------------------------------|--|--|
| <ul style="list-style-type: none">Hold its x and y coordinates as doublesCalculate its magnitude on demand | | |

| Matrix3x3d | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------------------------|
| <ul style="list-style-type: none">Transform a Vector3d by itselfStatically create Matric3x3d instances for 3d rotation | | <ul style="list-style-type: none">Vector3d |

| Line3d | | |
|---------------------------------------------------------------------------|--|----------------------------------------------------------|
| <ul style="list-style-type: none">Hold 2 Vector3d instances | | <ul style="list-style-type: none">Vector3d |

| Line2d | | |
|---------------------------------------------------------------------------|--|----------------------------------------------------------|
| <ul style="list-style-type: none">Hold 2 Vector2d instances | | <ul style="list-style-type: none">Vector2d |